KEEP THESE SHEETS ON TOP OF THE LEFT SIDE OF MAIN FILE!

Information List for Individual Solid Waste Facilities

FACILITY NAME City of Big Timber Class II Landfill
LICENSE NUMBER 308 **CLASS** II **LIC.TYPE** L
COUNTY Sweet Grass
CITY Big Timber
LOCATION DESCRIPTION Located 1 mile north of Big Timber - 3 miles east on Howie Road.
HOURS OF OPERATION Wednesday & Saturday from 1:00 p.m. to 5:00 p.m.
DATE OF LAST INSPECTION ~~8/13/96~~ 8-18-98

Application Received	3/5/90
NOD sent	6/28/90
Response Received	8/6/90
Health Officer Notification Sent	10/19/90
Beginning of Thirty-Day Public Notice Period	11/16/90
Health Officer 15-day Review Period Beginning	12/8/90
License Sent to Health Officer for Signature	12/7/90
Validated by Health Officer and Sent to Licensee	12/29/90

****

Alternative Liner Plan Received	
Alternative Liner Plan Approved	
Permitted Burning Site, if so, when approved?	3/17/92
Closure/Post-Closure Plan Received	3/5/90 4-29-98
Closure/Post-Closure Approved	9/2/94
Environmental Assessment Final	10/9/90
Environmental Impact Statement Final	
Ground Water Monitoring Plan Received	
Ground Water Monitoring Plan Approved	
Date Ground Water Monitoring Commenced	September 1991
Hazardous **Waste Screening** Plan Received	6/2/94
Hazardous **Waste Screening** Plan Approved	9/2/94
Leachate Collection System Plan Received	
Leachate Collection System Plan Approved	
License Modification received	11/2/94
License Modification type (i.e., ADC, burn pile, compost, recycling, landfarm)	Exclude annual inspection by a licensed Professional Engineer
License Modification approved	4/12/95
License Modification received	**7/1/96**
License Modification type (i.e., ADC, burn pile, compost, recycling, landfarm)	**ADC**
License Modification approved	**7/25/96**
Methane Monitoring Plan Received	

KEEP THESE SHEETS ON TOP OF THE LEFT SIDE OF MAIN FILE!

Methane Monitoring Plan Approved . . . .
New Unit Design Received . . . .
New Unit Design Approved . . . .
No-Migration Petition Received . . . . N/A
No-Migration Petition Approved . . . . N/A
Operation & Maintenance Plan Received 3/5/90
Operation & Maintenance Plan Approved 12/7/90
Run-On/Run-Off Plan Received 6/2/94
Run-On/Run-Off Plan Approved 9/2/94
Sampling and Analysis Plan Received . . . .
Sampling and Analysis Plan Approved . . . .
Service Area **Expansion** Application Received . . . .
Service Area **Expansion** Application Approved . . . .
Special Waste Handling Plan Received . . . .
Special Waste Handling Plan Approved . . . .

Request for Information Received (Date)
Brief Description of Request

Reply (Date)

Request for Information Received (Date)
Brief Description of Request

Reply (Date)

Request for Information Received (Date)
Brief Description of Request

Reply (Date)

Request for Information Received (Date)
Brief Description of Request

Reply (Date)

Date Complaint Received Date Complaint Resolved
Brief Description of Complaint

Date of Reply

BIGTIMBR.308

April 10, 1995

LANDFILL ROUTE SLIP

☐ **NEW APPLICATION**
Jon D.
Jim W.
Cathy

☐ **NEW LICENSE**
Jon D.
Jim W.
Carol
Cathy
Michelle

April 12, 1995

☐ **HEALTH OFFICER CARD**
Carol
Cathy
Michelle

☐ **INSPECTIONS**
Pat C.
Carol

☐ **INTERIM CLOSURES**
Jim W.
Carol
Cathy

☐ **CLOSURES**
Jim W.
Carol
Cathy

☑ **CHANGE IN LICENSE ~~FOR FEE STATUS~~**
Jon D.
Jim W. JW
Carol CU
Cathy cw
proof Mw 4-11-95

File: Sweet Grass Co. | Attach copy to license of Big Timber Class II Landfill #308
Thank you. LMW

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

Waste Management Division
Solid Waste Management Program
406/444-1430

FAX # (406) 444-1499

STATE OF MONTANA

OFFICE LOCATION: 2209 PHOENIX AVE. HELENA, MONTANA

MAILING ADDRESS: PO BOX 200901 HELENA, MT 59620-0901

April 12, 1995

Ronald E. Thomas
Public Works Director
City of Big Timber
P.O. Box 416
Big Timber, Montana 59011

SUBJECT: License Modification for Big Timber Class II Landfill, License #308

Dear Mr. Thomas:

The purpose of this letter is to notify the City that their request to modify their existing license (#308) to exclude annual inspections by a licensed professional engineer has been approved by the Department of Health and Environmental Sciences, Solid Waste Management Program. The required 30-day public comment period has come to a close without written or oral comments.

You will not be issued a new license reflecting the licensing condition modification. Instead, please attach this letter to your permanent license. Similarly, I will attach a copy of this letter to our copy of your license in our files.

Although the City is no longer required to hire a professional engineer for yearly inspections, the Program would encourage you to do so regardless. As mentioned in previous letters and discussions, there are benefits to working with an engineer you feel comfortable with. For example, an engineer could cross-check approved plans with current conditions of the landfill in order to determine whether or not you are following them correctly and are in compliance.

Thank you for your cooperation in this matter. If you have any questions or comments, please do not hesitate to contact this office.

Sincerely,

Lara M. Dando

Lara M. Dando
Solid and Hazardous Waste Specialist

cc: Rod Fink, R.S., Courthouse, Box 111, Columbus, MT 59019
City of Big Timber, P.O. Box 416, Big Timber, MT 59011
Dr. Monroe, County Health Officer, Sweet Grass Co. Health Dept., P.O. Box 1067, Big Timber, MT 59011

F:\USR\CB5405\WP\LICENSE.95\BIGTMBR.LIC

ROUTE SLI[illegible]

DEPARTMENT OF HEALTH & ENVIRONMENTAL SCIENCES

TO: 2/28/95 Proof MW DATE: 2/28/95

1. Jim JW
2. Jon JD 4. Roger RC
3. Dayna DDS Cathy R. / Carol UC

☑ Approval
☐ Note and Return
☐ Prepare reply
☐ As requested

☑ Comment
☐ Note and File
☐ Signature
☐ For your information

☐ Necessary Action
☐ Investigate
☐ See Me
☐ Per Conversation

(3 letters & public notice)

REMARKS: File: Sweetgrass County / Big Timber Class II Landfill Mainfile, licensing side of file.

Attached:
- Letter to Paper
- Public notices
- Letter to Big Timber
- Letter to Health Officer

Thanks!

FROM: Lara D.

Mailed 3-3-95

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
Waste Management Division
Solid Waste Management Program
406/444-1430
FAX # (406) 444-1499
STATE OF MONTANA
OFFICE LOCATION: 2209 PHOENIX AVE. HELENA, MONTANA
MAILING ADDRESS: PO BOX 200901 HELENA, MT 59620-0901

March 3, 1995

Ronald E. Thomas
Public Works Director
City of Big Timber
P.O. Box 416
Big Timber, Montana 59011

SUBJECT: Landfill Inspection Requirements

Dear Mr. Thomas:

Thank you for your November 2, 1994 letter requesting a modification to your existing license to exclude annual inspections by a licensed professional engineer. The Montana Solid Waste Program will process your request. I should point out that there are benefits to working with an engineer. Most importantly, plans designed by licensed engineers are necessary in order to properly operate the landfill in compliance with the rules and regulations governing solid waste management and disposal. Once these plans have been approved, the landfill is required to carefully follow them. Concurrently, financial assurance requirements warrant the need to hire an engineer in order to properly calculate closure and post-closure care costs. These cost estimates are required to be updated annually.

Program inspections are designed to ensure that the facility is operating in compliance with the laws and rules, and generally following approved plans. The purpose of annual inspections by a licensed professional engineer would be to evaluate the landfill's operations more specifically by looking at slopes, elevations, trench and stockpile locations and dimensions, compaction efficiency, etc. Therefore, it is to your benefit to work closely with an engineer you feel comfortable with. For your information, I have included a list of consultants that would be willing to work with you on your landfill.

The next step in modifying the conditions of your license is to place public notices in the local newspaper and around town. The purpose of the public notices is to inform all interested governmental agencies, public groups, and/or individuals of the proposed licensing modification and to take public comment on the proposed change. The public will have an opportunity to

comment for a period of thirty (30) days starting from the date of this letter, at which time a decision will be made as to our future action. This action may be in the form of rejecting your request or issuing a license reflecting the changes requested, with the approval of the county health officer.

At this time, the Program has not received an inspection report for 1994; therefore, please submit this report as soon as possible. If you have any questions or comments, please do not hesitate to contact this office.

Sincerely,

Lara M. Dando

Lara M. Dando
Solid and Hazardous Waste Specialist

Enclosure: List of Consultants

cc: Rod Fink, Courthouse, Box 111, Columbus, MT 59019
City of Big Timber, P.O. Box 416, Big Timber, MT 59011
Dr. Monroe, County Health Officer, Sweet Grass Co. Health Dept., P.O. Box 1067, Big Timber, MT 59011

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Solid & Hazardous Waste Bureau
Telephone (406) 444-1430

To: Interested Persons

From: Solid Waste Program Staff (444-1430)

Date: March 1993

Subject: Consultant List

The following Montana firms have done solid waste work in the State of Montana in the past, or they have specifically asked to be listed for solid waste services. They are listed in alphabetical order:

Ken Beiser, Hydrogeologist
1396 KM Ranch Road
Whitefish, MT 59937

Big Horn Environmental
P.O. Box 4054
Butte, MT 59701

Brown & Associates
Box 608
Park City, MT 59063

Braun Intertec
Environmental, Inc.
P.O. Box 80190
Billings, MT 59108

Camp Dresser & McKee Inc.
Power Block Building
Level 4, Suite 4R
Helena, MT 59601

Chen Northern
P.O. 4699
Helena, MT 59601

Damschen & Associates
P.O. Box 4817
Helena, MT 59604

E.R.M. - Rocky Mountain, Inc.
6th & Last Chance Gulch
Helena, MT 59601

ESA Consultants
215 W. Mendenhall
Bozeman, MT 59715

Envirocon, Inc.
101 International Way
P.O. Box 8243
Missoula, MT 59807

Environmental Services, Inc.
P.O. Box 3386
Butte, MT 59702

GeoResearch, Inc.
910 Helena Avenue
Helena, MT 59601

Golder & Associates
4104 148th Avenue NE
Redmond, WA 90052

HKM Associates
P.O. Box 31318
Billings, MT 59107

Howard Newman, Hydrogeologist
1200 Tulip Lane
Missoula, MT 59802

Hydrometrics
2727 Airport Road
Helena, MT 59601

Interstate Engineering
P.O. Box 648
Sidney, MT 59270

Land & Water Consulting Inc.
P.O. Box 8254
Missoula, MT 59807

L.C. Hansen & Company
2969 Airport Road
Helena, MT 59601

MCS Inc., Mountain Laboratories
2104 S. Reserve Street
Missoula, MT 59801-6451

Morrison-Maierle Environmental
P.O. Box 6147
Helena, MT 59604

MSE, Inc.
P.O. Box 4078
Butte, MT 59702

Olympus Environmental
765 Colleen Street
Helena, MT 59601-7713

P.C.I., Inc.
3115 Russell
Missoula, MT 59801

PRC Environmental
Management, Inc.
Power Block Building
Suite 612
Helena, MT 59601

Power Environmental Services,
Inc.
P.O. Box 3386
Butte, MT 59702

Prairie States/HKM
215 Lake Avenue South
Miles City, MT 59301

Robert Peccia & Associates
P.O Box 5653
Helena, MT 59604

Roy F. Weston, Inc.
1919 Fairway Drive
Bozeman, MT 59715

Schafer & Associates
611 N. Wallace
Bozeman, MT 59715

Spectrum Engineering
3302 4th Avenue North
Billings, MT 59101

Special Resource
Management Inc.
P.O. Box 4168
Butte, MT 59703

Tetra Tech, Inc.
2969 Airport Road
Helena, MT 59601

Thomas, Dean, & Hoskins
1200 25th Street South
Great Falls, MT 59401

W.M.W. Engineers
750 W. Second Street
Whitefish, MT 59937

Woodward Clyde Consultants
Power Block Building
Suite 4-P
Helena, MT 59601

This list may not include all of the firms which have solid waste experience in Montana, but these represent a good cross section of capabilities in the field. Some out-of-state firms have also done work in Montana but have not been specifically listed. Names of some of these are available in our office.

We would recommend that individual consultants be asked to provide a specific list of their qualifications and experience in the field to insure that their skills are suitable for your specific project. Some of the firms listed may be oriented toward specialized areas (i.e. hydrogeology, landfill engineering).

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
Waste Management Division
Solid Waste Management Program
406/444-1430
FAX # (406) 444-1499

STATE OF MONTANA

OFFICE LOCATION: 2209 PHOENIX AVE.
HELENA, MONTANA

MAILING ADDRESS: PO BOX 200901
HELENA, MT 59620-0901

PUBLIC NOTICE

An application to modify the City of Big Timber Class II Landfill (license number 308) existing license conditions has been submitted to the Montana Department of Health and Environmental Sciences, Waste Management Division, for review. One of the current license conditions requires the landfill to be inspected annually by a licensed professional engineer (PE). By modifying the City of Big Timber's solid waste management license, this inspection would no longer be required. This modification does not affect the Department's responsibility to conduct yearly inspections of the facility. The name and address of the applicant follows:

City of Big Timber
P.O. Box 416
Big Timber, Montana 59011

The Department has reviewed the request and found it to be complete. The purpose of this notice is to inform the public of the proposed action and to seek their participation in the decision-making process. A thirty (30) day comment period from the date of this notice will be given for the public to submit written comments to the Department concerning the proposed modification.

Dated this 3rd day of March, 1995.

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
Waste Management Division
Solid Waste Management Program
406/444-1430
FAX # (406) 444-1499
STATE OF MONTANA

OFFICE LOCATION: 2209 PHOENIX AVE.
HELENA, MONTANA

MAILING ADDRESS: PO BOX 200901
HELENA, MT 59620-0901

March 3, 1995

Lance Monroe, M.D.
County Health Officer
Sweet Grass County Health Department
P.O. Box 1067
Big Timber, Montana 59011

Dear Doctor Monroe:

This correspondence will serve notice that the Montana Department of Health and Environmental Sciences has received a request to modify the existing City of Big Timber Class II Landfill license conditions from:

City of Big Timber
P.O. Box 416
Big Timber, Montana 59011

One of the current license conditions requires the landfill to be inspected annually by a licensed professional engineer (PE). By modifying the City of Big Timber's solid waste management license, this inspection would no longer be required. This modification does not affect the Department's responsibility to conduct yearly inspections of the facility. This notification is in compliance with the Administrative Rules of Montana (ARM) 16.14.511(2).

In addition, please find three (3) public notices. Pursuant to ARM 16.14.511(3), the local health officer must post one (1) public notice at the nearest post office and two (2) other public buildings serving the geographical area of the proposed solid waste system. A copy of this public notice has been sent to the applicant and to the area newspaper.

If you have any questions, please do not hesitate to contact this office.

Sincerely,

Lara M. Dando

Lara M. Dando
Solid and Hazardous Waste Specialist

Enclosures: Public Notices (3)

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DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

Waste Management Division
Solid Waste Management Program
406/444-1430

FAX # (406) 444-1499

STATE OF MONTANA

OFFICE LOCATION: 2209 PHOENIX AVE.
HELENA, MONTANA

MAILING ADDRESS: PO BOX 200901
HELENA, MT 59620-0901

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City of Big Timber
P.O. Box 416
Big Timber, Montana 59011

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Dated this 3rd day of March, 1995.

"AN EQUAL OPPORTUNITY EMPLOYER"

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
Waste Management Division
Solid Waste Management Program
406/444-1430
FAX # (406) 444-1499
STATE OF MONTANA
OFFICE LOCATION: 2209 PHOENIX AVE. HELENA, MONTANA
MAILING ADDRESS: PO BOX 200901 HELENA, MT 59620-0901

March 3, 1995

Editor
Big Timber Pioneer
P.O. Box 190
Big Timber, Montana 59011

SUBJECT: City of Big Timber Class II Landfill License #308 Modification Request

Dear Editor:

State law requires that all solid waste management systems in Montana be approved and licensed by the Montana Department of Health and Environmental Sciences. I am enclosing a public notice pertaining to the City of Big Timber's request to modify the conditions of their existing solid waste Class II landfill license.

This notice is currently being circulated for thirty (30) days to assure public knowledge of the proposed action. We request that the enclosed notice be published as a legal notice in your newspaper as soon as possible. We are making every effort possible to generate public awareness and interest in this licensing action.

Please submit billing in the prescribed manner to the Department of Health and Environmental Sciences, Waste Management Division, P.O. Box 200901, Cogswell Building, Helena, MT 59620-0901. We request that this notice be run one time only. Please include at least one (1) original copy of the notice with the bill.

Thank you in advance for your assistance.

Sincerely,

Lara M. Dando

Lara M. Dando
Solid and Hazardous Waste Specialist
cc/enc: Support Services, MDHES
Cathy Siegner, MDHES Information Officer

Enclosure: Public Notice

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DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
Waste Management Division
Solid Waste Management Program
406/444-1430
FAX # (406) 444-1499
STATE OF MONTANA
OFFICE LOCATION: 2209 PHOENIX AVE. HELENA, MONTANA
MAILING ADDRESS: PO BOX 200901 HELENA, MT 59620-0901

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City of Big Timber
P.O. Box 416
Big Timber, Montana 59011

The Department has reviewed the request and found it to be complete. The purpose of this notice is to inform the public of the proposed action and to seek their participation in the decision-making process. A thirty (30) day comment period from the date of this notice will be given for the public to submit written comments to the Department concerning the proposed modification.

Dated this 3rd day of March, 1995.

City of Big Timber
P.O. Box 416
Big Timber, Montana 59011

Phone
Clerk 932-5610
Treasurer 932-5611

Lara D.

RECEIVED

DEC 22 1994

rec

Montana Department of Health
and Environmental Sciences
Waste Management Division

November 2, 1994

Department of Health &
Environmental Sciences
P.O. Box 200901
Cogswell Building
Helena, MT 59620-0901

Re: Landfill Inspections.

To Whom It May Concern,

The City of Big Timber would like to have one issue under licensing conditions changed. We feel that as long as the State is doing inspections at the landfill, we should not have to hire an engineer to do an inspection.

Would you please consider this matter and let us know via written response.

Sincerely,

Ronald E. Thomas
Ronald E. Thomas
Public Works Director
City of Big Timber
P.O. Box 416
Big Timber, MT 59011

RECEIVED

NOV 04 1994

rec

Montana Department of Health
and Environmental Sciences
Waste Management Division

DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES
SOLID AND HAZARDOUS WASTE BUREAU
SOLID WASTE PROGRAM

SOLID WASTE MANAGEMENT SYSTEM LICENSE

This certifies that

BIG TIMBER LANDFILL

has been approved for renewal and is Licensed by the

State of Montana, Solid and Hazardous Waste Bureau

as an

CLASS II LANDFILL

SYSTEM LICENSE NUMBER 308

This license is contingent upon payment of fees for JULY 1, 1994 through JUNE 30, 1995.

This license may be revoked if the Licensee or the Owner/Operator violates any provisions of Title 75, Chapter 10, Parts 1 and 2, or rules adopted in accordance with that law.

Roger C. Thorvilson

Roger C. Thorvilson
Acting Bureau Chief

License Conditions: 1) ONLY GROUP II & III WASTES MAY BE DISPOSED OF AT THE LANDFILL. 2) NO SEPTIC TANK PUMPINGS OR OTHER LIQUID OR SEMI-LIQUID WASTES MAY BE DISPOSED OF AT THE SITE. 3) THE LANDFILL MUST BE INSPECTED ANNUALLY FOR ADHERENCE TO THE SUBMITTED AND APPROVED PLANS BY A QUALIFIED ENGINEER WITH A COPY OF THAT REPORT BEING SUBMITTED TO THE BUREAU. 4) ANY LIQUID RECOVERED IN LEACHATE WITNESS PIPES MUST BE ANALYZED WITH A REPORT SUBMITTED TO THE BUREAU.

THIS LICENSE IS NON-TRANSFERABLE.

Item No. 3 please remove

Sweet Grass Co.

D&A

DAMSCHEN & ASSOCIATES, INC.

CONSULTING ENGINEERS

2030 11TH AVENUE • SUITE 11
P.O. BOX 4817 • HELENA, MT 59604
TELEPHONE (406) 449-8627

September 30, 1991

Mr. Jim Wilbur
Solid & Hazardous Waste Bureau
Cogswell Building
Helena, MT 59620

Re: Big Timber Landfill Startup

Dear Jim:

Please find enclosed an "As-Built" drawing of the new Big Timber landfill. In addition to conducting the on-site survey to prepare the attached drawing, we also conducted the necessary inspections to verify that the leachate collection piping was installed properly and the bottom 12 inches of the trench was properly compacted.

On September 24, 1991 the City placed their first load of waste into the trench. The City operators, as well as the four City Councilmen were present and we conducted a two-hour training session on the proper techniques for compacting the waste and placing the daily cover. The City started using the landfill full time on September 25; correspondingly the last load of waste was placed at the existing landfill on September 24, 1991. We also obtained samples from the seven monitoring wells on September 24, 1991. We will forward the results of these tests to your office once we obtain them.

We appreciate the assistance your office has provided during the review and approval process. If you have any questions, please do not hesitate to call.

Very truly yours,

DAMSCHEN & ASSOCIATES, INC.

Barry E. Damschen, P.E.
Project Manager

cc: City of Big Timber

Encl.

RECEIVED

OCT 1 1991

MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID & HAZARDOUS WASTE BUREAU

D&A
DAMSCHEN & ASSOCIATES, INC.
CONSULTING ENGINEERS
2030 11TH AVENUE • SUITE 11
P.O. BOX 4817 • HELENA, MT 59604
TELEPHONE (406) 449-8627

April 15, 1991

Mr. James Wilbur
Montana Department of Health and Environmental Sciences
Solid & Hazardous Waste Bureau
Room B201
Cogswell Building
Helena, MT 59620

RECEIVED
APR 22 1991
Montana Department of Health
and Environmental Sciences
Solid and Hazardous Waste Bureau

Re: New Big Timber Landfill

Dear Jim Wilbur:

As per our recent telephone conversation, please find enclosed a copy of a revised plan sheet that reflects the change that is being planned for the access road. The County Road Superintendent requested that we move the road location approximately 350 feet west of the originally proposed road location.

Also please note that the City is constructing a new fence around the entire perimeter of the site. The fence will consist of 2"X4" hog wire openings with 2 strands of barb wire on the top for the north and east sides. On the west and south sides the fence will have graduated size openings varying from 3"X6" near the bottom to 8"X6" near the top. This fence also will have 2 strands of barb wire on top. The total height of the new fence on all four sides will be approximately 54". This fence type and height is consistent with the fencing requirements stipulated in your previous letter to the City and my conversation with Tony Grover on March 22, 1991.

Finally our firm is finalizing the feasibility analysis of baling solid waste in Big Timber. We are tentatively planning on presenting our analysis at the May 6 council meeting. I know you have shown some interest in this subject and thought that you may want to attend that meeting if you schedule permits.

Please call if you have any questions or comments.

Very truly yours,

DAMSCHEN & ASSOCIATES, INC.

Barry E. Damschen, P.E.
Project Manager

Enclosure
cc: City of Big Timber

#308 City of Big Timber

License forwarded to licensee: 12/29/90
date

Health Officer Signature

RECEIVED

JAN 01 1990

MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID & HAZARDOUS WASTE BUREAU

BIG TIMBER, MT
PM
DEC 31
1990
59011

Buffalo Bill Cody
USA 15

MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
Solid & Hazardous Waste Bureau
Room B201, Cogswell Building
Helena, Montana 59620

MONTANA DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES
SOLID WASTE MANAGEMENT BUREAU

LICENSE TO OPERATE A SOLID WASTE MANAGEMENT SYSTEM

LICENSE NUMBER: 308 DATE: December 8, 1990

NAME OF FACILITY: City of Big Timber Class II Sanitary Landfill

This license authorizes the licensee to operate a: ☒ landfill disposal site,

☐ transfer station, ☐ container program, ☐ resource recovery facility,

☐ other ________________,

within 18 acres*, located in the NE 1/4 Section(s) 8

Township 1N Range 15E , Sweet Grass County.

This facility serves the following area: City of Big Timber and Sweet Grass County

(*See attachment A for specific site boundaries.)*

This license is issued in compliance with Section 75-10-221, MCA, 1979.

Application for this license has been made in due form by:

Licensee: City of Big Timber

Address: City Hall
Big Timber, MT 59011

Site classification: II ☐ Conditional ☒ Permanent

Conditions of license: 1.) Only Group II & III wastes may be disposed of at the landfill, 2.) No septic tank pumpings or other liquid or semi-liquid wastes may be disposed of at the site, 3.) The landfill must be inspected annually for adherence to the submitted and approved plans by a qualified engineer with a copy of that report being submitted to the Bureau, and 4.) Any liquid recovered in leachate witness pipes must be analyzed with a report submitted to the Bureau.

HEALTH OFFICER

*(*License must be validated by health officer before it is effective.)*

Roger C. Thorson

for DUANE L. ROBERTSON, CHIEF
SOLID WASTE MANAGEMENT BUREAU

THIS LICENSE IS NOT TRANSFERABLE TO ANOTHER LICENSEE OR LOCATION

ROUTE SLI[illegible]

DEPARTMENT OF HEALTH & ENVIRONMENTAL SCIENCES

TO: Proof ✓

DATE: 12/7/90

1. Tony TB
2. Roger
3. Duane

☑ Approval
☐ Note and Return
☐ Prepare reply
☐ As requested

☐ Comment
☐ Note and File
☑ Signature
☐ For your information

☐ Necessary Action
☐ Investigate
☐ See Me
☐ Per Conversation

REMARKS:

FROM: JW

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

STAN STEPHENS, GOVERNOR
FAX #(406) 444-1499

STATE OF MONTANA

OFFICE LOCATION: 836 Front Street
Helena, Montana

MAILING ADDRESS: Cogswell Building
Helena, MT 59620

Solid & Hazardous Waste Bureau
Telephone: (406) 444-1430

December 7, 1990

Wallace Walker, M.D.
County Health Department
P.O. Box 1409
Big Timber, MT 59011

Subject: Licensing of Big Timber landfill

Dear Dr. Walker:

Enclosed is a solid waste management license for a Class II landfill site for the City of Big Timber. Please sign the enclosed license and forward it to the applicant in the enclosed envelope. Also, please sign and return the postcard to us.

Your signature is required to validate this license. According to the law, you must make your decision within 15 days. If you decide not to sign the license based on a finding that the requirements of the Montana Solid Waste Management Act cannot be satisfied, you must notify the applicant, the department, and any interested persons in writing. The applicant will have the right to appeal your decision to the Board of Health within 30 days of receiving your written notice.

If you have any questions or comments please feel free to write or call.

Sincerely,

James Wilbur

James Wilbur
Solid Waste Program

encl.

JW/jw

"AN EQUAL OPPORTUNITY EMPLOYER"

ROUTE SLIP

DEPARTMENT OF HEALTH & ENVIRONMENTAL SCIENCES

TO: Proof ✓

DATE: 12/6/90

1. Tony TB

2. Roger RCT

3. Duane

☑ Approval
☐ Note and Return
☐ Prepare reply
☐ As requested

☐ Comment
☐ Note and File
☐ Signature
☐ For your information

☐ Necessary Action
☐ Investigate
☐ See Me
☐ Per Conversation

REMARKS:

FROM: JW

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

STAN STEPHENS, GOVERNOR
FAX #(406) 444-1499

STATE OF MONTANA

OFFICE LOCATION: 836 Front Street
Helena, Montana

MAILING ADDRESS: Cogswell Building
Helena, MT 59620

Solid & Hazardous Waste Bureau
Telephone (406) 444-1430

December 7, 1990

^F1^
^F2^
^F3^

Subject: Licensing the Proposed City of Big Timber Class II Sanitary Landfill

Dear ^F4^:

This letter is to respond to concerns expressed by various citizens in correspondence submitted during the public comment period for this license application. Concerns in several areas were raised by citizens about the licensing of the proposed Big Timber landfill site. Most comments were concerning the potential visual impacts to the area and the adjacent properties, the potential for pollution of the Yellowstone River, the effect of high winds on the proposed facility, and possible alternatives to the proposed site not discussed in the Environmental Assessment (EA). I will attempt to respond to each comment with a discussion of how this concern is addressed by the applicant and the extent to which the State's authority in issuing a solid waste management license does or does not relate to this concern.

Visual Impact of proposed landfill

The concern over the potential visual impact of a landfill to this area has two basic elements to it. First, the visual impact of the landfill activity will be mitigated by proper operation of the landfill by the City as certified in their operation plan and adherence to the Department's rules governing landfill operations, which the City has certified that it will do. The operation plan for the proposed landfill calls for only one trench to be excavated and in use at a time with the topsoil bermed on the east and west sides of the exposed trench. The wastes that are deposited each day are required to be compacted and covered by a minimum of six inches of soil cover by the end of that operating day. Once a trench has been filled to capacity a final cover of two feet of soil cover will be applied and the City plans to revegetate that land surface. Secondly, litter control, which is required of all solid waste management systems in Montana, is planned to be controlled on this site by various means. Any litter that may

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escape the planned screens and site fencing must be cleaned up by the City personnel.

High Winds

Several comments referred to this area experiencing high winds on occasion. The Department understands the concerns over this situation, but must remind those persons that most sites in Montana experience periods of high winds at different times during the year and this situation does not preclude a well-run landfill from operating. We would expect the City to refrain from disposal of wastes on the site during extreme wind events and the City is responsible for collecting litter blown from the disposal area in a timely manner.

Pollution Potential

The EA describes the various measures undertaken by the City to prevent and/or detect any potential problems the landfill may have in containing potential contaminates from the surrounding environment. The Department accepts these measures as practical and adequate for the type of activity the City is proposing. If leachate is detected in the witness pipe planned for the disposal trenches, a groundwater monitoring program can be implemented utilizing the existing monitoring wells, and if contamination of groundwater is found, remediation measures would be required of the City.

Character of the Area and Alternatives

Most of the comments received referred to the decision to locate this landfill in an area that had been subdivided with covenants attached to the titles to restrict the type of development that may occur on these subdivided lands. This being the case, I must point out that subdivision with attached covenant protection is not zoning. Zoning of this part of Sweet Grass County has not been undertaken by the County Commissioners. Zoning is a legal process to restrict landuse, with appropriate procedures to insure protection of all interested parties. Subdivision with covenant protection is a private action to provide small acreage properties to sell, and covenants are contractual agreements between the owner and buyer. The Montana Solid Waste Management Act does not give the Department authority to defacto zone an area from a certain landuse. That would infringe on local planning authority.

Our licensing authority is to determine if the site decided upon by the applicant is environmentally suitable for a landfill and that the plan of operation complies with all State regulations. In this case the City did conduct a two-year search and planning

process for siting a landfill. Several sites were found to be suitable and were considered, but only this site was available for purchase by the City for this purpose.

Other waste disposal options are not presently available beyond what was mentioned in the EA. The Livingston Incinerator does not have the available capacity to handle the wastes generated by the citizens of Big Timber or Sweet Grass County on a year around basis.

Increased Population and Costs

Some comments raised the possibility that the life of this proposed landfill may be shortened by the potential increase in the County's population by proposed mining and development ventures. This may happen. Sweet Grass County has lost population the last ten years, if this trend reverses itself the estimated life of the proposed landfill may be less. This is not an issue that would impact the licensing of this site. Also the costs of the land and operation is not a licensing issue, but a local decision and a matter of community planning.

The department has issued an environmental assessment and gathered the public comments concerning the issuance of this license. It has been determined that no further information has been presented to change that environmental assessment and the decision has been made to issue a solid waste management system license to the City of Big Timber for this proposed landfill. If at some time in the future you witness or are aware of violations of this license in the operation of this landfill, I encourage you to contact the appropriate City personnel first about correcting the problem. If the problems persist, contact us at the Solid Waste Program. We will endeavor to have that problem corrected as soon as possible. Thank you for your participation in this process and I hope you will continue to be involved in resolution of solid waste issues in your community.

Sincerely,

James Wilbur
Solid Waste Program

cc: Paul Sihler, EQC, Helena
City of Big Timber, P.O. Box 416, Big Timber, MT 59011
Rod Fink R.S., Courthouse, Box 111, Columbus, MT 59019
Wallace Walker, M.D., County Health Dept., P.O. Box 1409, Big Timber, MT 59011

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

STAN STEPHENS, GOVERNOR
FAX #(406) 444-1499

STATE OF MONTANA

OFFICE LOCATION: 836 Front Street
Helena, Montana

MAILING ADDRESS: Cogswell Building
Helena, MT 59620

Solid & Hazardous Waste Bureau
Telephone (406) 444-1430

December 7, 1990

James Devenny, Mayor
City of Big Timber
City Hall
Big Timber, MT 59011

Subject: Licensing of Big Timber landfill

Dear Mayor Devenny;

This letter is to notify you that your application for a solid waste management system license for the new City of Big Timber Class II landfill has been approved by the Department. The license has been sent to the County Public Health Officer for his signature and will be forwarded under a separate cover.

One item that must be completed before use of this landfill commences is that a plan for the design of the leachate witness pipes must be submitted and approved by the Department.

Conditions of this Solid Waste Management License to operate a class II landfill are:

1. Only Group II & III wastes may be accepted for disposal at the landfill.

2. The landfill will not accept any liquid or semi-liquid wastes.

3. An annual engineering evaluation is required. This report will evaluate compliance with the operation and maintenance plan submitted and approved by this Department. This report will be due by the end of the month of December of every year.

4. Any liquid recovered in the leachate witness pipes must be analyzed with a report submitted to the Department. Reports of all sampling and tests must be submitted to the department in a timely fashion.

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The Department did receive comments during the public comment period on this licensing action. I am enclosing a copy of those letters and a copy of our response for your information.

If you have any questions, do not hesitate to contact this office.

Sincerely,

James Wilbur

James Wilbur
Solid Waste Program

attachment

cc: Damschen & Associates, P.O. Box 11th Avenue, Helena MT 59604
Rod Fink, R.S., Courthouse, Box 111, Columbus, MT 59019
Robert A. Jackson, M.D., County Health Dept., P.O. Box 819, Big Timber, MT 59011

JW/jw

November 7, 1990

Mr. James Wilbur
Solid Waste Program
Cogswell Building
Helena, MT 59620

Dear Mr. Wilbur:

I am writing this letter as President of PIA, a small Montana partnership with land along Howie Road east of the proposed landfill site. The letter is, if course, in response to your letter of 10/19/90.

When the Howie Road site and the Sondeno land purchase were first proposed we sent the two enclosed letters. Neither letter was acknowledged.

Regarding your very complete and well documented EA, we have the following concerns or comments:

1. "Hauling to Billings" may be the only alternative at this date, but I cannot believe that as of the date of our first letter, Sweet Grass County did not offer alternative sites without the rather large drawbacks of the proposed Howie Road site.

2. Aesthetics- Originally the location of small ranches of a section or two, Howie Road has become in the past several years, the location of a fast growing number of ranchettes. Some of these 20 acre parcels have been purchased by local people and built on; others have attracted future retirees, some from out-of-state.

Several days ago, I visted at one of the houses in the area. The marvelous view from this house encompassed the rugged Crazy Mountains and wonderful Beartooth Mountains, plus a stretch of the Yellowstone River. The occupants informed me that soon, if plans go ahead unchanged, the view will also include the "dump".

Although I have not had a chance to check the accuracy of the statement, I am told that the landfill will be visable from I-90. How embarassing!

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MONTANA DEPARTMENT OF HEALT
AND ENVIRONMENTAL SCIENCES
SOLID & HAZARDOUS WASTE BUREA

The high winds for which the Yellowstone River Valley is noted will make it virtually impossible to control all refuse. Not a pleasant thought when one considers those who have bought in the area.

3. Costs: My thoughts on costs are based solely on common sense, conversations, and your communication, not on hard facts.

For example, the amount of site preparation, unnecessary had the site been chosen to avoid such expense, seems exorbitant. Just the need to build a large "holding pond" to (hopefully) protect the integrity of the Yellowstone River, the US's only undamed major river, will be one of the extra expenses demanded by the Sondeno site. In addition to these and apparently other extraordinary construction expenses, the potential of continual clean-up can add much to on-going costs.

4. Pollution: The need and, of course, the desire to avoid additional pollution is world-wide...if one agrees that pollution is not only measured by the purity of water, but also by what we hear, see and smell, those persons now living along Howie Road or considering the purchase of a home site there, are in for unpleasant surprises. There is an unfortunate possibility, Mr. Wilbur, that the Sondeno site, if developed, will bring to the pristine, at least, mostly pollution-free Howie Road area a combination of all these pollution categories.

Thank you, Mr. Wilbur, for giving us this opportunity to explain some of our thoughts regarding the proposed new Big Timber Landfill site.

Sincerely,

PROPERTY INVESTMENT ASSOCIATES

Charles C Ramsey

Charles C. Ramsey
President

BERG, LILLY, STOKES, ANDRIOLO, TOLLEFSEN & SCHRAUDNER
A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW

BEN E. BERG, JR.
MICHAEL J. LILLY
W. LEE STOKES
RICHARD J. ANDRIOLO
GIG A. TOLLEFSEN
LEANNE M. SCHRAUDNER

ADVANCED TECHNOLOGY PARK
910 TECHNOLOGY BOULEVARD, SUITE A
BOZEMAN, MONTANA 59715

TELEPHONE: (406) 587-3181
FAX: (406) 587-3240

August 17, 1989

City of Big Timber
P.O. Box 416
Big Timber, Montana 59011

RE: PIA and City of Big Timber

Dear Sir or Madame:

This letter is written to inform you that while Property Investment Associates does not support the choice of the landfill adjacent to their property, if that site has been chosen and selected by the City, PIA will expect the City to comply with all state and federal regulations and nothing herein shall prohibit PIA from proceeding with any action that they may have if, in fact, the new landfill site creates a nuisance or any sort of hazard for the property owners adjacent to the landfill site.

Sincerely,

Leanne M. Schraudner

LMS:css

cc: Charles C. Ramsey, P.O. Box 396, Big Timber, Montana 59011

July 6, 1989

City of Big Timber
Box 416
Big Timber, MT 59011

Dear Sirs:

Property Investment Associates established a sub-division on the Howie Road in 1978. At that time it was suggested that we put strict covenants on the property in order to maintain the rural character of the area rather than down-grade an otherwise attractive region.

Since we followed the concept of good planning, it is obviously counter-productive to place a land-fill on the adjoining property. Such a move will considerably devalue the land and run contrary to the initial concept arrived at with the help and assistance of the planning authorities.

We fully understand the difficulty in adequately locating the city land fill, and we appreciate the work that has already transpired in the effort to obtain a satisfactory location. We hope that another location can be found with many of the attributes of this suggested one on the Howie Road without it's planning drawback.

Sincerely,

PROPERTY INVESTMENT ASSOCIATES

Charles C. Ramsey

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MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID & HAZARDOUS WASTE BUREAU

November 13, 1990
6115 South Ironton Ct
Englewood, Colorado
80111

Department of Health
and Environmental Services
Cogswell Building
Helena, Montana 59620

Dear Sirs,

In 1979 we purchased 40 acres of property located on Howie Road East of Big Timber, Montana. This property had very strict zoning regulations. Our intent is to build a home on this property for retirement. We are 61 years of age and third generation Montanans, raised and educated in the state.

I think it is criminal for the government to establish a garbage dump adjacent to our property.

There is certainly property elsewhere that does not have the covenants such as ours that would be equally appropriate for a dump.

We ask you if you had worked all your life to establish a "golden years" retirement retreat how would you respond to a garbage dump being located next to you?

Please let us hear from you.

Sincerely,

Bill and Carol Badgley

303-771-3295

DJF Holdings, Inc.
3104 Freeman Street
San Diego, CA 92106

Mr. James Wilbur
Solid Waste Program
Cogswell Building
Helena, MT 59620

Dear Mr. Wilbur,

I am a substantial investor in a subdivision project along Howie Road controlled by Property Investments Associates (PIA) in Big Timber. This letter is in response to the Environmental Assessment from your office dated October 19, 1990. I am totally opposed to locating the landfill site East of Big Timber on Howie Road.

Not only will locating the "dump" dramatically decrease the value of our investment but loss of future sales and potential litigation by existing owners of homesites will cause substantial financial damage to PIA and to me. I urge you to reject this site and encourage the City of Big Timber to reconsider other sites.

I can not believe the City would wish to locate the dump so as to be visible from the interstate and so close to the Yellowstone. I am not a expert but I doubt that the groundwater will not quickly impact the River. The aesthetics will change immediately and that should be obvious to anyone who cares to go out and look at the proposed site. Perhaps those who issued a report indicating minor impact should be put in the position of someone with a homesite overlooking the dump as they view the River and the Crazy Mountains.

My point of view is not only as an investor but as one who has come to love the area and plans to retire there in a few years. There must be a more acceptable site with less impact on the River, views and nearby property owners. Please send it back to the planners at the City of Big Timber. How it got this far in spite of our protests is beyond me, but an even bigger mistake will be made if the project is approved.

Sincerely yours,

Donald J Fleischli, MD

Donald J. Fleischli, M.D.
for DJF Holdings, Inc. Plan

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MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID & HAZARDOUS WASTE BUREAU

DJF/bme
cc: CC Ramsey, Leanne M. Schraudner Esq., James A. Devenny, Mayor

November 15, 1990

Dear Mr. Wilbur,

The proposed action regarding the placement of the New Big Timber landfill is a serious mistake which will SCAR the Big Timber area for the next 60 years.

Obviously the City Council and References forgot to look north at the dump site as you're traveling either east or west on I-90, or from the South Frontage Rd. out of Big Timber.

The new landfill site is on a southerly sloping grade perfectly elevated to every east and west bound traveler crossing the United States. There is a brand new blue/gray house already within 100 yards of the proposed fence line & from I-90 is seen so perfectly clear. Basically the planned aesthetics will be spotted by millions of people as they approach and leave Big Timber.

Not only will this great little town be known for its back drop of the Crazy Mountains, the Beartooth Mountains and the Yellowstone River winding its way through it, but also will now have its first visible blend of mans garbage. Big Timber will now be known as the town with the landfill in open view.

They have also forgotten about the famous Big Timber Wind that will blow your hat off. They couldn't have picked a windier location. Elevated, wide open and unprotected. Imagine the visibility of all the trash blowing in the air from the highway as you look north via I-90. Plus the grassy rolling slopes littered with paper. This Landfill will create its own painting to countless people. They can't build windscreens high enough on that wide open windy plain. And only a fool would put a landfill so exposed to the elements as this one is. The dump should be in a box canyon, or at least on the wind protected side of a mountain.

In closing, I'll be short. Direct downhill runoff into the Yellowstone River within a 1/4 mile.

An open flood plain to deal with.

And last of all the city is buying a 90 acre piece of dryland for an inflated price of $90,000 which only 18 acres are usable. Eighteen acres dividedby 90,000 equals $5,000 an acre. This will also be an embarrassing financial mistake for the city planners.

Louis and Clarke were remembered for naming the Big Timber. I wonder what names they would give to the planners of this new proposed mess off Howie Rd.?

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AND ENVIRONMENTAL SCIENCES
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Best of Luck, Bill William

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AND ENVIRONMENTAL SCIENCE
SOLID & HAZARDOUS WASTE BUR

November 13, 1990

Mr. James Wilbur
Solid Waste Program
Montana Department of Health and Environmental Sciences
Solid & Hazardous Waste Bureau
Cogswell Building
Helena, MT 59620

Subj: Proposed City of Big Timber Class II Landfill

Dear Mr. Wilbur:

I am in receipt of your letter of 19 October 1990 and wish to comment on three items: 1) the Environmental Assessment; 2) the project; and, 3) the letter itself.

I. ENVIRONMENTAL ASSESSMENT (EA):

1. The EA appears to have several serious deficiencies, not the least of which is that it appears to be based on an assumption that "It is anticipated the site will serve **a population of 2,000 residents** for the next 61 years." Further, "The site is designed to provide a solid waste disposal facility for the City of Big Timber **and possibly Sweet Grass County** for approximately 61 years." (Emphasis added)

COMMENT: There is no mention of impending development and significant growth due to the development of hardrock mining activities in the county. Further, I would assume that the county residents will use the new facilities, just as they now use the existing facility, particularly for those noxious substances they will not tolerate on their own property. The county already has a larger population than that mentioned in the report. If the closest licensed facility is in Billings, as the report states, what is to keep the City from accepting other garbage for profit?

THEREFORE, THE UNDERLYING ASSUMPTIONS, ON WHICH THE REPORT IS BASED, ARE NOT VALID AND THE REPORT ITSELF IS SUSPECT.

2. You speak of the only alternative as being in Billings.

COMMENT: What about the incinerator in Livingston? Also, there appears to be an adequate site west of Big Timber along the frontage road, located on State Land near an existing hog operation. That site was dropped without comment when adjacent landowners expressed concern. The site is closer to town and would not impact county roads or traffic patterns or other environmental considerations.

3. You state that "No EIS necessary."

COMMENT: Why? Your conclusion that "...no significant impact to the environment **is likely**..." (emphasis added) is not backed up by discussion or factual data. My conclusion is exactly the opposite given the data you quote in the EA, particularly given the potential for a rapid expansion in the use of the facility.

4. Regarding the "Comments" section of the report, no mention is made of the extreme winds, some of which have exceeded 125 MPH, that frequently rip through the area.

COMMENT: This will adversely impact, to a much greater extent that indicated by the report, the spread of litter and garbage and dust. The soils in the area, as stated in the report, are extremely fragile and subject to significant wind erosion problems. That also is only briefly alluded to in your comments. Increased traffic, as is likely, will exacerbate the problems mentioned herein.

5. Paragraph 5) - Aesthetics. You mention the many problems but gloss over the effects without addressing other aspects of the problem and possible solutions.

COMMENT: While this is "... a sparsely populated rural area..." it does have its owners. In fact, the area was subdivided some ten years ago and there are a number of landowners located within one mile of the proposed project that will be impacted. Most of them are not on your mailing list and have not received your package for comment. A check of legal records at the courthouse would have shown their interests. Further, the land was developed and put under covenants based on the recommendations of the then existing City-County Planning Board and their planner, Mr. Sears. They specifically requested covenants against ANY commercial development to enhance and protect the rural nature of the area. For the same authority to now go against their own recommendations, having coerced the initial restrictions, seems to be a miscarriage of justice, especially since the owners in the area (who were not notified of this action) purchased the property given those assurances.

There has already been a decrease in the value and desirability of the land in the area due to the proposed project. A valid, written offer for an adjacent property in the immediate area was withdrawn when the prospective purchaser was told of the project. There can be no more meaningful action than that when relating the project to the value and desirability of the area!

My paragraph II applies.

6. Paragraph 6) - Air Quality.

COMMENT: My previous comments apply. Your assumptions on use and traffic do not appear to be valid. Further, I was not aware of the provision for open burning. That will further degrade the aesthetics of the area and serve to spread garbage.

7. Paragraph 8) - Environmental Demands. You say "Locating the site closer to town would unfortunately result in other negative impacts."

COMMENT: What are they and why do they not apply to the site in question? I am concerned.

8. Paragraph 9) - Historical and Archaeological Sites.

COMMENT: Your verbiage sounds like quibbling. Has the site been investigated or does your comment simply mean what it says, just that there is "no record?"

9. Part II, Paragraph 10) - Industrial and Commercial Activity.

COMMENT: I fail to see what the present operation operating without a license has to do with the desirability of this site. Further, there is another commercial activity that is not mentioned in your "assessment." There has been recent talk about moving or developing a recycling center to or at the dump. This entails an entirely new set of problems and impacts, not the least of which is that there will be a considerable amount of trash exposed to the winds and environment for a much greater period of time, more traffic, more activity, etc., etc.

II. THE PROJECT: Rather than try to gloss over the negative impacts of the dump, it would be more meaningful to try to determine what actions could be taken to enhance and protect the area. For example, no mention is made of use of shelterbelts to shield the visual impact. The site will definitely impact the visual horizon without such an effort. A large shelterbelt would require a well or other water source, irrigation, fertilization, maintenance and care. But it would benefit the entire area and the wildlife that would come to use it. Not the least of the benefits would be trapping debris and silt, cutting the noise and other activity, and shielding it from view.

Further, I see no restrictions on future development that could lead to other, unforeseen problems. One being location of a recycling center and its attendant problems.

Finally, if the assumptions made are not accurate and the dump is only good for, say, 30.5 years rather than your estimate of 61, what does it do to the benefit/cost analysis for the property? Would it not be better to acquire a site with the potential for 50 or 100 years at a similar or lesser cost?

III. THE LETTER: To whom should I address my comments? It is not clear. Will the others in the immediate area be notified and given the right to comment?

In conclusion, I see the EA as an exceedingly weak document that borders on intellectual dishonesty. Not to have considered or discussed the items I have raised came as a real surprise to me. I had thought them so obvious as to be readily apparent to even the most casual observer. The entire issue should be re-evaluated, all questions answered, and assurances from the City should be forthcoming to the people in the immediate area and community before any permits are given.

Obviously, I would prefer that the dump not be adjacent to my property. If, however, there is no alternative (of that I am not convinced) I would ask that efforts be made to protect my values, those of the immediate neighbors, and the community as a whole.

Thank you for the opportunity to comment. I ask that my remarks be read into any record or proceedings concerning the proposed project.

Sincerely,

11/13/90

John M. Kirby

14 Jackson Road
Newport, RI 02840
phone: 401-846-3933 (h)
401-841-3892 (w)

Department of
Health & Environmental Sciences
Solid & Hazardous Waste Bureau
Cogswell building
Helena, Mt.

November 15, 1990

Dear Mr. Wilbur

This letter is in regard to the Environmental Assessment of the proposed Class II Landfill in Big Timber Montana.

Environmentally and aesthetically an atrocious mistake in my opinion.

Admittedly, I am not an expert on hydrogeologic investigation. However my common sense tell me that 2/3 of a mile, with an existing topography providing a direct method of travel for run-off from the proposed site, directly into the Yellowstone is a precarious plan indeed. Despite the plan of a detention basin. History has shown us, Nature prevails in most cases.

The impact of a contaminated Yellowstone River is too lengthy to access, however DEVASTATING would be a good word to start with. Big Timber is fortunate to have the Yellowstone River grace its landscape, along with the flora and fauna that reside there. Not only is it beautiful aesthetically, but it is a major source of revenue for the city recreationally, ranging from canoeing, fishing,hunting, etc. etc.. A county landfill located adjacent to this great river would plainly be done with little forsight for the future of this growing community. Therefore, I strongly disagree with the 'Potential Impact on Physical & Human Enviroments (pg. 4 of the E.A. letter) as being minor or none in most cases.The physical #'s 1,3,5,6,7 & 8 and Human #'s 1,2,6,8 & 11 need major disscussion.

Howie Road is reguarded to as a "sparsely populated rural area". However MUCH of theproperty along Howie Rd. has already been divided and zoned for 20 acre parcels and is for sale on the market. Many of the parcels are DIRECTLY adjacent to the proposed Landfill, and were there prior to the Landfill site. Another example of poor planning by the city council. With the existence of huge ranches encompassing so much property along the Yellowstone, Howie Rd. parcels offer a unique opportunity for future homeowners to build near the Yellowstone, with breathtaking views of the Crazies and Beartooth Mountains. A county Landfill in their 'front yard' would of course spoil this potential.

Another inportant question- How are 18 acres going to handle 61 years of garbage, especially with the possible population increase brought about by the minors?

In short Mr. Wilbur, the proposed Class II Sanatation Landfill in question is an environmental and financial threat to Big Timber and the Yellowstone River. I am counting on the sound judgment of our State Department of Health & Environmental Sciences and the Solid & Hazardous Waste Bureau to stop this disaster before it happens.

With High Hopes and Sincerity,

Betsy N Gray

Betsy N. Gray
Big Timber Residence

cc;P:I.A.
Tom Ellerhoff, Enviromental Sciences Division, DHES, Helena
Environmental Quality Council,Capital Comples, Helena

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MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID & HAZARDOUS WASTE BUREAU

DJF Holdings, Inc.
3104 Freeman Street
San Diego, CA 92106

Mr. James Wilbur
Solid Waste Program
Cogswell Building
Helena, MT 59620

Dear Mr. Wilbur,

I am a substantial investor in a subdivision project along Howie Road controlled by Property Investments Associates (PIA) in Big Timber. This letter is in response to the Environmental Assessment from your office dated October 19, 1990. I am totally opposed to locating the landfill site East of Big Timber on Howie Road.

Not only will locating the "dump" dramatically decrease the value of our investment but loss of future sales and potential litigation by existing owners of homesites will cause substantial financial damage to PIA and to me. I urge you to reject this site and encourage the City of Big Timber to reconsider other sites.

I can not believe the City would wish to locate the dump so as to be visible from the interstate and so close to the Yellowstone. I am not a expert but I doubt that the groundwater will not quickly impact the River. The aesthetics will change immediately and that should be obvious to anyone who cares to go out and look at the proposed site. Perhaps those who issued a report indicating minor impact should be put in the position of someone with a homesite overlooking the dump as they view the River and the Crazy Mountains.

My point of view is not only as an investor but as one who has come to love the area and plans to retire there in a few years. There must be a more acceptable site with less impact on the River, views and nearby property owners. Please send it back to the planners at the City of Big Timber. How it got this far in spite of our protests is beyond me, but an even bigger mistake will be made if the project is approved.

Sincerely yours,

Donald J Fleischli, MD

Donald J. Fleischli, M.D.
for DJF Holdings, Inc. Plan

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act
NOV 19 1990
IONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
OLID & HAZARDOUS WASTE BUREAU

DJF/bme
cc: CC Ramsey, Leanne M. Schraudner Esq., James A. Devenny, Mayor

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NOV 20 1990
MDHES
Environmental Sciences Div.

Department of
Health & Environmental Sciences
Solid & Hazardous Waste Bureau
Cogswell building
Helena, Mt.

November 15, 1990

Dear Mr. Wilbur

This letter is in regard to the Environmental Assessment of the proposed Class II Landfill in Big Timber Montana.

Environmentally and aesthetically an atrocious mistake in my opinion.

Admittedly, I am not an expert on hydrogeologic investigation. However my common sense tell me that 2/3 of a mile, with an existing topography providing a direct method of travel for run-off from the proposed site, directly into the Yellowstone is a precarious plan indeed. Despite the plan of a detention basin. History has shown us, Nature prevails in most cases.

The impact of a contaminated Yellowstone River is too lengthy to access, however DEVASTATING would be a good word to start with. Big Timber is fortunate to have the Yellowstone River grace its landscape, along with the flora and fauna that reside there. Not only is it beautiful aesthetically, but it is a major source of revenue for the city recreationally, ranging from canoeing, fishing,hunting, etc. etc.. A county landfill located adjacent to this great river would plainly be done with little forsight for the future of this growing community. Therefore, I strongly disagree with the 'Potential Impact on Physical & Human Enviroments (pg. 4 of the E.A. letter) as being minor or none in most cases.The physical #'s 1,3,5,6,7 & 8 and Human #'s 1,2,6,8 & 11 need major disscussion.

Howie Road is reguarded to as a "sparsely populated rural area". However MUCH of theproperty along Howie Rd. has already been divided and zoned for 20 acre parcels and is for sale on the market. Many of the parcels are DIRECTLY adjacent to the proposed Landfill, and were there prior to the Landfill site. Another example of poor planning by the city council. With the existence of huge ranches encompassing so much property along the Yellowstone, Howie Rd. parcels offer a unique opportunity for future homeowners to build near the Yellowstone, with breathtaking views of the Crazies and Beartooth Mountains. A county Landfill in their 'front yard' would of course spoil this potential.

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MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID & HAZARDOUS WASTE BUREAU

Another inportant question- How are 18 acres going to handle 61 years of garbage, especially with the possible population increase brought about by the minors?

In short Mr. Wilbur, the proposed Class II Sanatation Landfill in question is an environmental and financial threat to Big Timber and the Yellowstone River. I am counting on the sound judgment of our State Department of Health & Environmental Sciences and the Solid & Hazardous Waste Bureau to stop this disaster before it happens.

With High Hopes and Sincerity,

Betsy N Gray

Betsy N. Gray
Big Timber Residence

cc;P.I.A.
Tom Ellerhoff, Enviromental Sciences Division, DHES, Helena
Environmental Quality Council,Capital Comples, Helena

Department of
Health & Environmental Sciences
Solid & Hazardous Waste Bureau
Cogswell building
Helena, Mt.

November 15, 1990

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Betsy N Gray

Betsy N. Gray
Big Timber Residence

cc;P:I.A.
Tom Ellerhoff, Enviromental Sciences Division, DHES, Helena
Environmental Quality Council,Capital Comples, Helena

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NOV 19 1990

MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID & HAZARDOUS WASTE BUREAU

Betsy K Gray
P.O. Box 543
Big Timber, Mt.
59011

BIG TIMBER, MT
PM
NOV 16
1990
59011

Yosemite USA 25

Dept. of Health & Environmental Sciences
Solid & Hazardous Waste Bureau
836 Front Street, Cogswell Bldg.
Helena, Mt.
59620

ATT: James Wilbur

November 15, 1990

Dear Mr. Wilbur,

The proposed action regarding the placement of the New Big Timber landfill is a serious mistake which will SCAR the Big Timber area for the next 60 years.

Obviously the City Council and References forgot to look north at the dump site as you're traveling either east or west on I-90, or from the South Frontage Rd. out of Big Timber.

The new landfill site is on a southerly sloping grade perfectly elevated to every east and west bound traveler crossing the United States. There is a brand new blue/gray house already within 100 yards of the proposed fence line & from I-90 is seen so perfectly clear. Basically the planned aesthetics will be spotted by millions of people as they approach and leave Big Timber.

Not only will this great little town be known for its back drop of the Crazy Mountains, the Beartooth Mountains and the Yellowstone River winding its way through it, but also will now have its first visible blend of mans garbage. Big Timber will now be known as the town with the landfill in open view.

They have also forgotten about the famous Big Timber Wind that will blow your hat off. They couldn't have picked a windier location. Elevated, wide open and unprotected. Imagine the visibility of all the trash blowing in the air from the highway as you look north via I-90. Plus the grassy rolling slopes littered with paper. This Landfill will create its own painting to countless people. They can't build windscreens high enough on that wide open windy plain. And only a fool would put a landfill so exposed to the elements as this one is. The dump should be in a box canyon, or at least on the wind protected side of a mountain.

In closing, I'll be short. Direct downhill runoff into the Yellowstone River within a 1/4 mile.
An open flood plain to deal with.
And last of all the city is buying a 90 acre piece of dryland for an inflated price of $90,000 which only 18 acres are usable. Eighteen acres dividedby 90,000 equals $5,000 an acre. This will also be an embarrassing financial mistake for the city planners.

Louis and Clarke were remembered for naming the Big Timber. I wonder what names they would give to the planners of this new proposed mess off Howie Rd.?

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AND ENVIRONMENTAL SCIENCES
OLID & HAZARDOUS WASTE BUREAU

Best of Luck, Bill William

bn/WW

THE BILL WILLIAMS APIARIES
P.O. BOX 1407
BIG TIMBER, MT 59011

BIG TIMBER, MT
PM
NOV 16
1990
59011

Dept. of Health + Enviromental Sciences
Solid + Hazardous Waste Bureau
836 Front Street, Cogswell Bldg.
Helena, MT.
59620

ATT: James Wilbur

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MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID & HAZARDOUS WASTE BUREAU

November 13, 1990
6115 South Ironton Ct
Englewood, Colorado
80111

Department of Health
and Environmental Services
Cogswell Building
Helena, Montana 59620

Dear Sirs,

In 1979 we purchased 40 acres of property located on Howie Road East of Big Timber, Montana. This property had very strict zoning regulations. Our intent is to build a home on this property for retirement. We are 61 years of age and third generation Montanans, raised and educated in the state.

I think it is criminal for the government to establish a garbage dump adjacent to our property.

There is certainly property elsewhere that does not have the covenants such as ours that would be equally appropriate for a dump.

We ask you if you had worked all your life to establish a "golden years" retirement retreat how would you respond to a garbage dump being located next to you?

Please let us hear from you.

Sincerely,
Bill and Carol Badgley
303-771-3295

DENVER CO 802
1 PM
13 NOV
1990

SUPPORT DRUN
DRUGGED DRIVING
AWARENESS WEEK

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Department of Health
and Environmental Services
Cogswell Building
Helena, Montana 59620

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Mr & Mrs. Bill Badgley
6115 So. Ironton Ct.
Englewood, Colorado 80111

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MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID & HAZARDOUS WASTE BUREAU

November 13, 1990

Mr. James Wilbur
Solid Waste Program
Montana Department of Health and Environmental Sciences
Solid & Hazardous Waste Bureau
Cogswell Building
Helena, MT 59620

Subj: Proposed City of Big Timber Class II Landfill

Dear Mr. Wilbur:

I am in receipt of your letter of 19 October 1990 and wish to comment on three items: 1) the Environmental Assessment; 2) the project; and, 3) the letter itself.

I. ENVIRONMENTAL ASSESSMENT (EA):

1. The EA appears to have several serious deficiencies, not the least of which is that it appears to be based on an assumption that "It is anticipated the site will serve **a population of 2,000 residents** for the next 61 years." Further, "The site is designed to provide a solid waste disposal facility for the City of Big Timber **and possibly Sweet Grass County** for approximately 61 years." (Emphasis added)

COMMENT: There is no mention of impending development and significant growth due to the development of hardrock mining activities in the county. Further, I would assume that the county residents will use the new facilities, just as they now use the existing facility, particularly for those noxious substances they will not tolerate on their own property. The county already has a larger population than that mentioned in the report. If the closest licensed facility is in Billings, as the report states, what is to keep the City from accepting other garbage for profit?

THEREFORE, THE UNDERLYING ASSUMPTIONS, ON WHICH THE REPORT IS BASED, ARE NOT VALID AND THE REPORT ITSELF IS SUSPECT.

2. You speak of the only alternative as being in Billings.

COMMENT: What about the incinerator in Livingston? Also, there appears to be an adequate site west of Big Timber along the frontage road, located on State Land near an existing hog operation. That site was dropped without comment when adjacent landowners expressed concern. The site is closer to town and would not impact county roads or traffic patterns or other environmental considerations.

3. You state that "No EIS necessary."

COMMENT: Why? Your conclusion that "...no significant impact to the environment **is likely**..." (emphasis added) is not backed up by discussion or factual data. My conclusion is exactly the opposite given the data you quote in the EA, particularly given the potential for a rapid expansion in the use of the facility.

4. Regarding the "Comments" section of the report, no mention is made of the extreme winds, some of which have exceeded 125 MPH, that frequently rip through the area.

COMMENT: This will adversely impact, to a much greater extent that indicated by the report, the spread of litter and garbage and dust. The soils in the area, as stated in the report, are extremely fragile and subject to significant wind erosion problems. That also is only briefly alluded to in your comments. Increased traffic, as is likely, will exacerbate the problems mentioned herein.

5. Paragraph 5) - Aesthetics. You mention the many problems but gloss over the effects without addressing other aspects of the problem and possible solutions.

COMMENT: While this is "... a sparsely populated rural area..." it does have its owners. In fact, the area was subdivided some ten years ago and there are a number of landowners located within one mile of the proposed project that will be impacted. Most of them are not on your mailing list and have not received your package for comment. A check of legal records at the courthouse would have shown their interests. Further, the land was developed and put under covenants based on the recommendations of the then existing City-County Planning Board and their planner, Mr. Sears. They specifically requested covenants against ANY commercial development to enhance and protect the rural nature of the area. For the same authority to now go against their own recommendations, having coerced the initial restrictions, seems to be a miscarriage of justice, especially since the owners in the area (who were not notified of this action) purchased the property given those assurances.

There has already been a decrease in the value and desirability of the land in the area due to the proposed project. A valid, written offer for an adjacent property in the immediate area was withdrawn when the prospective purchaser was told of the project. There can be no more meaningful action than that when relating the project to the value and desirability of the area!

My paragraph II applies.

6. Paragraph 6) - Air Quality.

COMMENT: My previous comments apply. Your assumptions on use and traffic do not appear to be valid. Further, I was not aware of the provision for open burning. That will further degrade the aesthetics of the area and serve to spread garbage.

7. Paragraph 8) - Environmental Demands. You say "Locating the site closer to town would unfortunately result in other negative impacts."

COMMENT: What are they and why do they not apply to the site in question? I am concerned.

8. Paragraph 9) - Historical and Archaeological Sites.

COMMENT: Your verbiage sounds like quibbling. Has the site been investigated or does your comment simply mean what it says, just that there is "no record?"

9. Part II, Paragraph 10) - Industrial and Commercial Activity.

COMMENT: I fail to see what the present operation operating without a license has to do with the desirability of this site. Further, there is another commercial activity that is not mentioned in your "assessment." There has been recent talk about moving or developing a recycling center to or at the dump. This entails an entirely new set of problems and impacts, not the least of which is that there will be a considerable amount of trash exposed to the winds and environment for a much greater period of time, more traffic, more activity, etc., etc.

II. THE PROJECT: Rather than try to gloss over the negative impacts of the dump, it would be more meaningful to try to determine what actions could be taken to enhance and protect the area. For example, no mention is made of use of shelterbelts to shield the visual impact. The site will definitely impact the visual horizon without such an effort. A large shelterbelt would require a well or other water source, irrigation, fertilization, maintenance and care. But it would benefit the entire area and the wildlife that would come to use it. Not the least of the benefits would be trapping debris and silt, cutting the noise and other activity, and shielding it from view.

Further, I see no restrictions on future development that could lead to other, unforeseen problems. One being location of a recycling center and its attendant problems.

Finally, if the assumptions made are not accurate and the dump is only good for, say, 30.5 years rather than your estimate of 61, what does it do to the benefit/cost analysis for the property? Would it not be better to acquire a site with the potential for 50 or 100 years at a similar or lesser cost?

III. THE LETTER: To whom should I address my comments? It is not clear. Will the others in the immediate area be notified and given the right to comment?

In conclusion, I see the EA as an exceedingly weak document that borders on intellectual dishonesty. Not to have considered or discussed the items I have raised came as a real surprise to me. I had thought them so obvious as to be readily apparent to even the most casual observer. The entire issue should be re-evaluated, all questions answered, and assurances from the City should be forthcoming to the people in the immediate area and community before any permits are given.

Obviously, I would prefer that the dump not be adjacent to my property. If, however, there is no alternative (of that I am not convinced) I would ask that efforts be made to protect my values, those of the immediate neighbors, and the community as a whole.

Thank you for the opportunity to comment. I ask that my remarks be read into any record or proceedings concerning the proposed project.

Sincerely,

11/13/90

John M. Kirby

14 Jackson Road
Newport, RI 02840
phone: 401-846-3933 (h)
401-841-3892 (w)

NEW
Big Timber
file
Sweet Grass Co.

November 7, 1990

Mr. James Wilbur
Solid Waste Program
Cogswell Building
Helena, MT 59620

Dear Mr. Wilbur:

I am writing this letter as President of PIA, a small Montana partnership with land along Howie Road east of the proposed landfill site. The letter is, if course, in response to your letter of 10/19/90.

When the Howie Road site and the Sondeno land purchase were first proposed we sent the two enclosed letters. Neither letter was acknowledged.

Regarding your very complete and well documented EA, we have the following concerns or comments:

1. "Hauling to Billings" may be the only alternative at this date, but I cannot believe that as of the date of our first letter, Sweet Grass County did not offer alternative sites without the rather large drawbacks of the proposed Howie Road site.

2. Aesthetics- Originally the location of small ranches of a section or two, Howie Road has become in the past several years, the location of a fast growing number of ranchettes. Some of these 20 acre parcels have been purchased by local people and built on; others have attracted future retirees, some from out-of-state.

Several days ago, I visted at one of the houses in the area. The marvelous view from this house encompassed the rugged Crazy Mountains and wonderful Beartooth Mountains, plus a stretch of the Yellowstone River. The occupants informed me that soon, if plans go ahead unchanged, the view will also include the "dump".

Although I have not had a chance to check the accuracy of the statement, I am told that the landfill will be visable from I-90. How embarassing!

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MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID & HAZARDOUS WASTE BUREAU

The high winds for which the Yellowstone River Valley is noted will make it virtually impossible to control all refuse. Not a pleasant thought when one considers those who have bought in the area.

3. Costs: My thoughts on costs are based solely on common sense, conversations, and your communication, not on hard facts.

For example, the amount of site preparation, unnecessary had the site been chosen to avoid such expense, seems exorbitant. Just the need to build a large "holding pond" to (hopefully) protect the integrity of the Yellowstone River, the US's only undamed major river, will be one of the extra expenses demanded by the Sondeno site. In addition to these and apparently other extraordinary construction expenses, the potential of continual clean-up can add much to on-going costs.

4. Pollution: The need and, of course, the desire to avoid additional pollution is world-wide...if one agrees that pollution is not only measured by the purity of water, but also by what we hear, see and smell, those persons now living along Howie Road or considering the purchase of a home site there, are in for unpleasant surprises. There is an unfortunate possibility, Mr. Wilbur, that the Sondeno site, if developed, will bring to the pristine, at least, mostly pollution-free Howie Road area a combination of all these pollution categories.

Thank you, Mr. Wilbur, for giving us this opportunity to explain some of our thoughts regarding the proposed new Big Timber Landfill site.

Sincerely,

PROPERTY INVESTMENT ASSOCIATES

Charles C Ramsey

Charles C. Ramsey
President

BERG, LILLY, STOKES, ANDRIOLO, TOLLEFSEN & SCHRAUDNER
A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW

BEN E. BERG, JR.
MICHAEL J. LILLY
W. LEE STOKES
RICHARD J. ANDRIOLO
GIG A. TOLLEFSEN
LEANNE M. SCHRAUDNER

ADVANCED TECHNOLOGY PARK
910 TECHNOLOGY BOULEVARD, SUITE A
BOZEMAN, MONTANA 59715

TELEPHONE: (406) 587-3181
FAX: (406) 587-3240

August 17, 1989

City of Big Timber
P.O. Box 416
Big Timber, Montana 59011

RE: PIA and City of Big Timber

Dear Sir or Madame:

This letter is written to inform you that while Property Investment Associates does not support the choice of the landfill adjacent to their property, if that site has been chosen and selected by the City, PIA will expect the City to comply with all state and federal regulations and nothing herein shall prohibit PIA from proceeding with any action that they may have if, in fact, the new landfill site creates a nuisance or any sort of hazard for the property owners adjacent to the landfill site.

Sincerely,

Leanne M. Schraudner

LMS:css

cc: Charles C. Ramsey, P.O. Box 396, Big Timber, Montana 59011

July 6, 1989

City of Big Timber
Box 416
Big Timber, MT 59011

Dear Sirs:

Property Investment Associates established a sub-division on the Howie Road in 1978. At that time it was suggested that we put strict covenants on the property in order to maintain the rural character of the area rather than down-grade an otherwise attractive region.

Since we followed the concept of good planning, it is obviously counter-productive to place a land-fill on the adjoining property. Such a move will considerably devalue the land and run contrary to the initial concept arrived at with the help and assistance of the planning authorities.

We fully understand the difficulty in adequately locating the city land fill, and we appreciate the work that has already transpired in the effort to obtain a satisfactory location. We hope that another location can be found with many of the attributes of this suggested one on the Howie Road without it's planning drawback.

Sincerely,

PROPERTY INVESTMENT ASSOCIATES

Charles C. Ramsey

State Historic Preservation Office
Montana Historical Society
Mailing Address: 225 North Roberts • Helena, MT 59620-9990
Office Address: 102 Broadway • Helena, MT • (406) 444-7715

October 31, 1990

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MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID & HAZARDOUS WASTE BUREAU

James Wilbur
Dept Health and Environmental Sciences
Cogwell Building
Helena MT 59620

RE: Big Timber Landfill
S8-1N-15E

Dear Mr. Wilbur:

As requested, we have conducted a cultural resource file search for the above cited project location. Currently, no historical or archaeological sites are recorded within the designated search area. This may reflect a lack of prior survey rather than a known absence of cultural resources in the project area. According to records currently available to us, there have been no professional cultural resource surveys in this project area.

Prehistoric lithic scatters and stone circle sites are currently documented in adjacent sections.

Given the lack of previous cultural resource survey in the designated project area, we are unable to determine whether significant historic or archaeological resources will be impacted by the undertaking. A complete assessment of potential impacts to historical resources would warrant an on-the-ground cultural resource survey of the landfill site.

Thank you for consulting with us.

Sincerely,

David Schwab

David Schwab
State Archaeologist

File: DHES/Landfills/1990

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Misc. Application for licensing solid waste management City of Big Timber

Date Oct. 31, 1990

Balance due $18.00

Dept. of Health and Env.
Sciences
Solid & Hazardous
Waste Management
836 Front Street
Helena, MT 59620

Please remit balance due. We appreciate your patronage. Thank you!

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NOV 5 1990

MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID & HAZARDOUS WASTE BUREAU

PUBLIC NOTICE

An application for the licensing of a solid waste management system has been submitted to the Montana Department of Health and Environmental Sciences, Solid & Hazardous Waste Bureau, for review. The name and address of the applicant follows:

City of Big Timber
City Hall
P.O. Box 416
Big Timber, MT 59011

The proposed solid waste management system is located in the NE1/4 of Section 8, Township 1N, Range 15E, Sweet Grass County approximately 4.5 miles northeast of the City of Big Timber and will serve the City of Big Timber and possibly Sweet Grass County.

The Department has reviewed the application and found it to be complete. The purpose of this notice is to inform the public of the proposed action and to seek their participation in the decision-making process. Pursuant to the Administrative Rules of Montana (ARM), Rules 16.2.626(2) and 16.2.628(2), an Environmental Assessment has been prepared on the proposed facility and is available upon request from the Solid and Hazardous Waste Bureau, 836 Front Street, Helena, MT 59620. A 30-day comment period from the date of this notice will be given for the public to submit written comments to the Department concerning the proposed facility.

Dated this 19 day of October, 1990.

(Publish: October 31, 1990)

RECEIVED

NOV 16 1990

MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID & HAZARDOUS WASTE BUREAU

Affi vit of Publication

STATE OF MONTANA
SS
County of Sweet Grass

Betty Knight

being first duly sworn, deposes and says, at all times herein stated she was and now is the Office Manager of The BIG TIMBER PIONEER, a newspaper published weekly at Big Timber, MT, County of Sweet Grass and that the

PUblic Notice - application for licensing of solid waste management system

a copy of which is herewith annexed and attached, was printed and published in the said newspaper, and in the regular and entire issue thereof, once a week for One successive weeks on

October 31, 1990

Betty Knight

Sworn to and subscribed before me this 31st day of October, 1990.

Notary Public, State of Montana, residing at Big Timber, Montana.
My Commission expires on

June 15, 1992

RECEIVED

NOV 5 1990

MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID & HAZARDOUS WASTE BUREAU

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Affidavit of Publication

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County of Sweet Grass

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June 15, 1992

ROUTE SLIP

DEPARTMENT OF HEALTH & ENVIRONMENTAL SCIENCES

TO: DATE: 12/21/90

1. Tony TG
2. Roger KCS
3. Duane DLR

☑ Approval
☐ Note and Return
☐ Prepare reply
☐ As requested

☐ Comment
☐ Note and File
☐ Signature
☐ For your information

☐ Necessary Action
☐ Investigate
☐ See Me
☐ Per Conversation

REMARKS:

FROM: JW

SweetGrass

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

STAN STEPHENS, GOVERNOR
FAX #(406) 444-1499

STATE OF MONTANA

OFFICE LOCATION: 836 Front Street
Helena, Montana

MAILING ADDRESS: Cogswell Building
Helena, MT 59620

Solid & Hazardous Waste Bureau
Telephone: (406) 444-1430

October 19, 1990

Wallace Walker, M.D.
County Health Dept.
P.O. Box 1409
Big Timber, MT 59011

Dear Dr. Wallace;

I apologize for the oversight of not including your name on the mailing list for the Environmental Assessment of the proposed City of Big Timber landfill application. I am enclosing a copy with this letter. I am also enclosing a copies of the Montana Solid Waste Management Act and the Administrative rules covering solid waste disposal for your information. If you have any further questions concerning this matter or other solid waste issues, do not hesitate to contact me or this office.

Sincerely,

James Wilbur

James Wilbur
Solid Waste Program

JW/jw

Sweetgrass.

ROUTE SLIP

DEPARTMENT OF HEALTH & ENVIRONMENTAL SCIENCES

TO: DATE: 10/18/90

1. Tony TG
2. Roger RCS
3. ~~Duane~~

☑ Approval ☐ Comment ☐ Necessary Action
☐ Note and Return ☐ Note and File ☐ Investigate
☐ Prepare reply ☐ Signature ☐ See Me
☐ As requested ☐ For your information ☐ Per Conversation

REMARKS:

FROM: JW

DEPARTMENT OF
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STAN STEPHENS, GOVERNOR

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Telephone: (406) 444-1430

October 19, 1990

Editor
Big Timber Pioneer
P.O. Box 190
Big Timber, MT 59011

Dear Editor,

State law requires that all solid waste management systems in Montana be approved and licensed by the Montana Department of Health and Environmental Sciences. I am enclosing a public notice pertaining to the application for the licensing of a solid waste management system in your area. This notice is currently being circulated for thirty (30) days to assure public knowledge of the proposed action. We request that the enclosed notice be published as a legal notice in your newspaper as soon as possible. We are making every effort possible to generate public knowledge and interest in this licensing action.

Please submit billing in the prescribed manner to the Department of Health and Environmental Sciences, Solid & Hazardous Waste Bureau, 836 Front Street, Helena, MT 59620. We request that this notice be run one time only. Please include at least one original copy of the notice with the bill.

Thank you in advance for your assistance.

Sincerely,

James Wilbur

James Wilbur
Solid Waste Program

Encl.
cc: Fiscal Services

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

STAN STEPHENS, GOVERNOR

FAX #(406) 444-1499

STATE OF MONTANA

OFFICE LOCATION: 836 Front Street
Helena, Montana

MAILING ADDRESS: Cogswell Building
Helena, MT 59620

Solid & Hazardous Waste Bureau
Telephone: (406) 444-1430

PUBLIC NOTICE

An application for the licensing of a solid waste management system has been submitted to the Montana Department of Health and Environmental Sciences, Solid & Hazardous Waste Bureau, for review. The name and address of the applicant follows:

City of Big Timber
City Hall
P.O. Box 416
Big Timber, MT 59011

The proposed solid waste management system is located in the NE¼ of Section 8, Township 1N, Range 15E, Sweet Grass County approximately 4.5 miles northeast of the City of Big Timber and will serve the City of Big Timber and possibly Sweet Grass County.

The Department has reviewed the application and found it to be complete. The purpose of this notice is to inform the public of the proposed action and to seek their participation in the decision-making process. Pursuant to the Administrative Rules of Montana (ARM), Rules 16.2.626(2) and 16.2.628(2), an Environmental Assessment has been prepared on the proposed facility and is available upon request from the Solid & Hazardous Waste Bureau, 836 Front Street, Helena, MT 59620. A 30-day comment period from the date of this notice will be given for the public to submit written comments to the Department concerning the proposed facility.

Dated this 19 day of October, 1990.

AN EQUAL OPPORTUNITY EMPLOYER

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

STAN STEPHENS, GOVERNOR

FAX #(406) 444-1499

STATE OF MONTANA

OFFICE LOCATION: 836 Front Street
Helena, Montana

MAILING ADDRESS: Cogswell Building
Helena, MT 59620

Solid & Hazardous Waste Bureau
Telephone: (406) 444-1430

October 19, 1990

Wallace Walker, M.D.
County Health Dept.
P.O. Box 1409
Big Timber, MT 59011

Dear Dr. Wallace;

This correspondence will serve notice that the Montana Department of Health and Environmental Sciences has received a completed application for a solid waste management system from:

City of Big Timber
City Hall
P.O. Box 416
Big Timber, MT 59011

The application is for a solid waste landfill northeast of the City of Big Timber. This notification is in compliance with the Administrative Rules of Montana (ARM), Rule 16.14.511(2).

In addition, please find three (3) public notices. Pursuant to ARM Rule 16.14.511(3), the local health officer must post one public notice at the nearest post office and two other public buildings serving the geographical area of the proposed solid waste system.

A copy of this public notice has been sent to the area newspaper. If you have any questions, please contact this office.

Sincerely,

James Wilbur

James Wilbur
Solid Waste Program

encl.

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

STAN STEPHENS, GOVERNOR
FAX #(406) 444-1499

STATE OF MONTANA

OFFICE LOCATION: 836 Front Street
Helena, Montana

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Dated this 19 day of October, 1990.

"AN EQUAL OPPORTUNITY EMPLOYER"

EA

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

STAN STEPHENS, GOVERNOR

FAX #(406) 444-1499

STATE OF MONTANA

OFFICE LOCATION: 836 Front Street
Helena, Montana

MAILING ADDRESS: Cogswell Building
Helena, MT 59620

Solid & Hazardous Waste Bureau
Telephone: (406) 444-1430

October 19, 1990

James A. Devenny, Mayor, City of Big Timber, P.O. Box 416, Big Timber, MT
Eugene & Judy Sondeno, Box 3762 HC88, Big Timber, MT
Paul Gilbert, HC88 Box 3763, Big Timber, MT
John Kirby, 2B Jackson Road, Newport, RI 02840
Mrs. Mildred Morton, 1507 W. Main, Peoria, IL 61606
Mrs. Gwen Peterson, P.O. Box 1255, Big Timber, MT
Property Investments Associates, P.O. Box 396, Big Timber, MT
Damschen & Associates, P.O. Box 4817, Helena, MT 59604
Tom Ellerhoff, Environmental Sciences Division, DHES, Helena
Environmental Quality Council, Capital Complex, Helena
Documents Section, State Library, Capital Complex, Helena
State Historical Preservation Office, 225 N. Roberts, Helena

Ladies and Gentlemen:

Pursuant to the Administrative Rules of Montana, 16.2.604, the following Environmental Assessment has been prepared by the Department of Health and Environmental Sciences concerning the proposed City of Big Timber Class II Sanitary Landfill.

The purpose of the Environmental Assessment is to inform all interested governmental agencies, public groups or individuals of the proposed action and to determine whether or not the action may have a significant effect on the human environment. This Environmental Assessment will be circulated for a period of thirty (30) days at which time a decision will be made as to our future action.

If you care to comment on this proposed action, please do so within the allotted time.

Sincerely,

James Wilbur

James Wilbur
Solid Waste Program

DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES
836 Front Street, Helena, Montana 59620
(406) 444-1430

ENVIRONMENTAL ASSESSMENT (EA)

Division/Bureau: Environmental Sciences/Solid & Hazardous Waste Bureau

Project or Application: City of Big Timber Class II Sanitary Landfill

Description of Project:

The proposed Class II landfill site is located approximately four miles east of Big Timber on Howie Road. The site encompasses 90 acres in the Northeast 1/4 of Section 8, Township 1 North, Range 15 East, with approximately 18 acres identified as useable for landfill operation. It is anticipated the site will serve a population of 2,000 residents for the next 61 years. The project is divided in two phases, the first phase beginning on the eastern border of the site moving westerly as the trenches are filled. A trench and fill method is planned for the entire project with the trenches excavated to a depth of approximately 10 feet in a north south direction.

The city intends to utilize a track loader for compacting waste and providing daily and intermediate cover each day of landfill operation. Currently the city plans to open the landfill to the public only on Wednesday and Saturday afternoons from 1:00 - 5:00 p.m. A locked gate will prevent unauthorized use of the landfill when it is closed.

Benefits and Purpose of Proposal:

The site is designed to provide a solid waste disposal facility for the City of Big Timber and possibly Sweetgrass County for approximately 61 years. The existing landfill is expected to reach capacity before the end of 1990. The replacement landfill is proposed to provide the city and county with landfill capacity for the immediate future. The proposed site is located in a better hydrogeological setting with more natural protection to surface water and groundwater resources and should provide a more suitable landfill than the existing site.

Description and analysis of reasonable alternatives whenever alternatives are reasonably available and prudent to consider: The only alternative to the City of Big Timber would be to haul their solid waste to a regional licensed landfill for disposal. Presently the nearest regional landfill with sufficient capacity to take the City's waste would be at the City of Billings. This alternative would be very costly to the City in time, money, and energy due to the distance involved. Therefore, this alternative is not considered preferable to the proposed landfill site.

A listing and appropriate evaluation of mitigation, stipulations and other controls enforceable by the agency or another government agency:
The proposed landfill must meet the minimum requirements of the Montana Solid Waste Management Act and rules.

Recommendation: The recommendation of the Montana Department of Health and Environmental Sciences is to request input from the public regarding the proposal. In lieu of adverse public comment the Department proposes to license the landfill as a Class II Solid Waste Management System.

If an EIS is needed, and if appropriate, explain the reasons for preparing the EA:

No EIS necessary.

If an EIS is not required, explain why the EA is an appropriate level of analysis:

The Department finds that no significant impact to the environment is likely by operation of the proposed facility. The Environmental Assessment is an adequate document to address potential impact of the proposed landfill site.

Other groups or agencies contacted or which may have overlapping jurisdiction:
Air Quality Bureau, Montana Department of Health & Environmental Sciences; Sweet Grass County Health Officer

Individuals or groups contributing to this EA:
Damschen & Associates, Helena, MT; Chen Northern, Inc., Helena, MT; and TetraTech, Helena, MT

EA prepared by: James Wilbur
Date: October 19, 1990

POTENTIAL IMPACT ON PHYSICAL ENVIRONMENT

		MAJOR	MODERATE	MINOR	NONE	UNKNOWN	ATTACHED
1. TERRESTRIAL AND AQUATIC LIFE AND HABITATS	1.			XXX			XXX
2. WATER QUALITY, QUANTITY AND DISTRIBUTION	2.				XX		XXX
3. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE	3.			XXX			XXX
4. VEGETATION COVER, QUANTITY AND QUALITY	4.			XXX			XXX
5. AESTHETICS	5.			XXX			XXX
6. AIR QUALITY	6.			XXX			XXX
7. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENV. RESOURCES	7.				XX		
8. DEMANDS ON ENV. RESOURCES OF WATER, AIR AND ENERGY	8.			XXX			XXX
9. HISTORICAL AND ARCHAEOLOGICAL SITES	9.				XX		XXX

CUMULATIVE AND SECONDARY IMPACTS: None

POTENTIAL IMPACT ON HUMAN ENVIRONMENT

		MAJOR	MODERATE	MINOR	NONE	UNKNOWN	ATTACHED
1. SOCIAL STRUCTURES AND MORES	1.				XX		
2. CULTURAL UNIQUENESS AND DIVERSITY	2.				XX		
3. LOCAL AND STATE TAX BASE AND TAX REVENUE	3.				XX		
4. AGRICULTURAL OR INDUSTRIAL PRODUCTION	4.			XXX			XXX
5. HUMAN HEALTH	5.				XX		
6. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES	6.				XX		
7. QUANTITY AND DISTRIBUTION OF EMPLOYMENT	7.				XX		
8. DISTRIBUTION OF POPULATION	8.				XX		
9. DEMANDS FOR GOVERNMENTAL SERVICES	9.			XXX			XXX
10. INDUSTRIAL AND COMMERCIAL ACTIVITY	10.			XXX			XXX
11. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS	11.				XX		

CUMULATIVE AND SECONDARY IMPACTS: None

COMMENTS REGARDING POTENTIAL IMPACT OF THE PROPOSED SOLID WASTE MANAGEMENT SYSTEM

I. Potential Impact on Physical Environment

1) Terrestrial and Aquatic Life and Habitats - The new landfill will displace some small mammal species currently inhabiting the area of the landfill. Disturbed earth will change the characteristic population of these small mammals, particularly rodents. The proposed site and vicinity is also inhabited by wildlife including antelope, mule deer, whitetail deer, coyote, fox, grouse, and various avian species. Wildlife forage availability and habitat on the propose site is typical of the area which consist primarily of native grasses and shrubs. Loss of this acreage to wildlife habitat is not considered to be critical because it has been managed for livestock grazing and is not a unique or critical wildlife environment. Some larger animals may choose to relocate due to noise, traffic and disturbance of forage. With proper revegetation of finished landfill areas, the displacement of larger animals may be temporary.

Most landfills change the habits and characteristics of birds in the area of the site. Properly operated landfills do little to encourage or attract scavengers such as gulls, crows and magpies. Improperly operated landfills may at times provide attractive habitat to these species and other scavenger species. In a similar fashion, a properly operated landfill does little to create insect problems. Improperly compacted and covered sites, and sites with drainage problems, may cause increases of nuisance insects and vectors such as flies, mosquitos, etc.

2) Water Quality, Quantity, and Distribution -

Surface Water

Located approximately 2/3 of a mile directly south of the proposed landfill site lies the Yellowstone River. The floodplain of the Yellowstone River is approximately one half mile south of the proposed landfill site. The Yellowstone River, whose headwaters originate in Yellowstone National Park, is classified by the State Water Quality Bureau as a B-1 stream. B-1 stream classification designates the River as suitable for drinking, culinary and food processing purposes after conventional treatment; bathing, swimming and recreation; growth and propagation of salmanoid fishes and associated aquatic life, water fowl and fur bearers, and agricultural and industrial water supply. The Yellowstone River runs easterly through the Big Timber area. Although the City of Big Timber does not obtain their public water supply from the Yellowstone River, many downstream towns and cities do.

A natural drainage exists in the south-central portion of the landfill site. The topography of the drainage is such that

it provides a direct method of travel for run-off generated at the site to the Yellowstone River. To prevent migration of surface water runoff, a detention basin will be constructed to hold all surface water that is generated within the planned waste disposal areas. This basin or holding pond will be six feet deep and approximately 60' wide and 110' long. The basin has been sufficiently sized to contain the surface water runoff generated by a 25 year-24 hour storm event. The entire landfill site is designed to enhance drainage of surface water off the site into the detention basin thus prevent the runoff from eventually discharging to the Yellowstone River. Since it is unlikely that surface water will contact any solid waste, the surface runoff is not expected to be contaminated.

Drainage ditches will also be constructed upslope of the proposed landfill area to direct surface runoff from the land area above the disposal areas around the site and allow the water to continue on its path downhill.

Groundwater

The investigation of the hydrogeology of the site was conducted by reviewing existing information from geological studies and domestic wells in the vicinity, drilling six wells on the proposed site, completing these wells as monitoring wells, conducting aquifer tests, and excavating three test pits within the proposed landfill area. When the monitoring wells were installed subsurface materials encountered were logged, sampled, and water bearing zones were defined. The aquifer tests conducted determined the groundwater flow direction, gradient beneath the proposed landfill site, and the hydraulic characteristics of the water-bearing zones encountered.

The review of available geologic reports and well log data of the area indicated that the principal groundwater-bearing units in the vicinity of the proposed landfill are alluvium of the Yellowstone River and thin sandstone and mudstone beds in the Hell Creek Formation. Well logs were obtained for six domestic wells located 0.5 to 1.5 miles northwest of the proposed landfill site. Information on the well logs indicate that these wells ranged in depth from 46 to 140 feet. Four domestic wells located 1.0 to 1.5 miles to the east of the proposed landfill were found to be from 65 to 233 feet deep. These wells are all likely completed in the Hell Creek Formation.

Artesian groundwater was found in five of the six monitoring wells installed on the site. This indicates that the water-bearing units encountered are confined above and below by relatively impermeable strata of clay and shale. Well BT-3 encountered unconfined water in a sandstone and mudstone zone at a depth of approximately 12 to 14 feet. This well is likely

recharged by surface water from the drainage it is located adjacent to.

The direction of the groundwater flow beneath the proposed site is generally northeast to southwest. The network of wells installed provides to excellent monitoring array. Two of the wells are topographically upgradient and the others are directly in the path of the groundwater that would move underneath the proposed landfill. The average flow velocity of the groundwater in these aquifers has been estimated to be 1.8 cm/day.

The uppermost water bearing zone near the southern part of the proposed site is a sandstone which is present at a depth of approximately 26 feet below ground surface. The maximum trench depth proposed for the landfill at the southern edge of the landfill site is 10 feet. The minimum separation between the bottom of the waste disposal areas of the landfill and the first water-bearing zone would be 16 feet. This meets current State requirements for minimum separation distances between solid waste and groundwater for Class II landfills.

The reason water is focused on so intensely during a site investigation is that when water is in continuous or intermittent contact with refuse, an undesirable liquid called leachate is produced. Landfill leachate is defined as a grossly polluted liquid characterized by high concentrations of dissolved chemicals, high chemical and biological oxygen demand, and hardness. Leachate composition is a function of the composition of the refuse and the volume of infiltrating water, and is extremely variable. The threat to groundwater from waste disposal sites depends on the volume and nature of the leachate, the amount of moisture in contact with refuse, the type of earth material through which the leachate must pass, and the hydrologeology of the site. Disposal site success depends on how leachate production and movement is prevented or minimized by primarily engineering design, appropriate site location, and/or management practices.

The total annual precipitation in the Big Timber area is approximately 14 inches (U.S. Department of Agriculture, 1974). This low precipitation total, combined with the drainage design for the proposed landfill, will minimize the moisture that will be potentially allowed to contact the buried waste and possibly produce leachate. A perforated pipe will be placed at the lowest end of each trench used at the landfill which will direct any water or leachate in that trench to a dry well storage. If leachate is found to occur in significant quanities, then the state will work with the owner to mitigate leachate problems. The soil conditions and geology of the site described in #3 should inhibit the infiltration of water into the buried refuse. If any leachate is produced the soils will restrict that liquid from mingling with the groundwater of the site. Therefore due to the site characteristics, the design of the landfill operation, and the required operations of the landfill, no

operation, and the required operations of the landfill, no significant impact on the water resources of the site is expected.

3) Geology and Soil Quality, Stability and Moisture - Geology at the site of the proposed site consists of interbedded shale, mudstone, and sandstone beds of the Hell Creek Formation. The beds appear to be dipping to the southwest at approximately 5 to 10 degrees. The primary surficial features in the area include numerous low hills, generally consisting of more resistant mudstone and sandstone beds.

Municipal solid waste permanently changes the nature of the subsoils and surface soils in the area of waste disposal. In Montana, biological degradation in a landfill generally proceeds at a very slow rate. Subsidence of completed areas usually proceeds slowly, often taking many years before noticeable settling occurs. The City of Big Timber utilizes a track loader for compacting the solid waste. Use of this type of machinery generally provides a degree of compaction which slows settling and decomposition in sanitary landfills. The quality, stability and moisture holding characteristics of the landfilled waste are quite different from the native soils. Proper closure of a completed landfill requires reclamation of finished surfaces in a fashion which minimizes impacts of these effects. The City has submitted an acceptable closure plan for the landfill with the expressed intention to use 2.5 feet of final soil cover on the waste filled trenches. This would surpass the current State requirements for closure of the a Class II landfill.

The soils at the site were examined by the digging of three test pits on the proposed site. Grain size analysis of soil samples from these pits found the material to be composed of approximately 30 percent clay, 62 percent silt, and 8 percent sand. This material was classified as a low plastic lean clay (CL) in the Unified Soil Classifications System. The high percentages of silt and clay in the soils of the site indicate that the soils of the site will be a suitable material for the base of the landfill and cover material. General estimates of the permeability of silt and clay range from 1 x 10^{-3} cm/sec to 1 x 10^{-7} cm/sec for silt and from 1 x 10^{-6} cm/sec to 1 x 10^{-9} cm/sec for clay (Freeze and Cherry, 1979; Fetter, 1980; Todd, 1980). A laboratory test for permeability of one of the soil samples was conducted. This test indicated the permeability of the remolded sample was 3 x 10^{-7} cm/sec. This soil type and range of permeabilities meets the siting criteria within the State rules for Class II landfills.

4) Vegetation Cover, Quantity and Quality - The proposed landfill vegetation is characterized as grassland on moderate to gently rolling terrain. The site and adjacent property has historically been used for grazing where the vegetation

consisted primarily of native grasses. Of the 90 acres within the proposed landfill boundaries, only 18 acres have been determined to be suitable for sanitary landfilling. The amount of land lost to grazing is not anticipated to have a significant impact on the environment or economy of the area.

Operation of the landfill site will dramatically affect vegetative cover across the site, particularly in the areas which are "open" and actively being excavated and filled with waste. Proper cover quality and cover soil placement are essential to revegetation upon completion of the landfill, since sub-soils excavated from below the ground surface will seldom have adequate nutrient value and soil structure to facilitate proper revegetation. Stress from biological decomposition of the wastes, however slow, such as methane gas production, drying due to the heat of biological decay, etc., can affect the finished cover soil and chances of survival of cover crops.

If each phase of the landfill is completed and revegetated as it is finished, the impact upon vegetation will be less than if large areas are saved for reclamation at a later date. Without proper re-seeding and nourishing of vegetation on the finished areas, volunteer growth can be expected to re-establish itself on the site, with a slow transition from undesirable, annual weedy growth to grasses and other more perennial varieties over time.

5) Aesthetics - Historically solid waste landfills tend to be aesthetically displeasing due to litter problems and continuous construction related activities required to operate and maintain the landfill. The proposed landfill is located approximately 4 miles northeast of Big Timber. The site is located in a sparsely populated rural area and is currently used for grazing purposes.

Scattered litter is a common aesthetic nuisance along haul routes and near landfill sites. Litter is frequently jolted out of pick-up beds and strewn along landfill haul routes. Also, deposited solid waste often gets blown out of waste cells before it is covered with dirt. Operational procedures exist which help mitigate strewn litter, although the problem cannot be completely abated. Utilization of trenching procedures in addition to compaction and daily coverage of waste reduces blowing litter. The site will have a perimeter fence constructed of hog wire and barb wire which will catch litter that escapes the active fill area. Portable litter screens will be placed around the active waste cells to help catch litter which blows out of the cells. Litter that accumulates on the screens and fence will be required to picked up. Any litter from the landfill site and along the haul routes will also be the responsibility of the City to clean up on a periodic basis.

Daily operation of heavy equipment needed to properly run a landfill will disturb the immediate view from local roads and

residences. Although this disturbance will be relatively minor, it will be long term (equivalent to the effective life of the landfill site).

Scarification of the land will also be noticeable. It is possible that the landfill site will be visible from town, as well as from other elevated areas. Upon completion of the landfill, the site is scheduled to be appropriately capped, contoured, and returned to usable grazing land.

6) Air Quality - The applicant has specified that part of the landfill will be set aside for open burning. Currently, state requirements allow only the burning of untreated wood wastes, after a permit is obtained from the Air Quality Bureau, MDHES. Any open burning will have some effect upon air quality in the vicinity of the site. Due to the sparse population of the area, if the proper procedures are followed, and reasonable care is exercised to prevent accidental landfill fires, the impact is expected to be short in duration and minimal in the long term. No other legal burning will be authorized at the landfill, however occasionally, accidental fires sometimes occur at landfill sites. If properly and quickly controlled, the fires do not present a significant impact upon air quality.

It is anticipated that exposing a minimal amount of soil to the effects of wind erosion will reduce potential impacts on air quality. Heavy earth-moving equipment generally enhances the mobility of dust particulates. As solid waste is disposed of in landfill cells, dozers will compact the waste to design standards and cover it with soil. Impacts of the above practices are expected to be relatively minor.

Landfill traffic will travel approximately 2-1/2 miles on Howie Road to the landfill site. Since Howie Road is unpaved, air quality may be impacted by traffic dust. Assuming packer trucks can haul 10 tons per load, 200 trips per year must be made to the landfill site. In addition to packer trucks landfill traffic includes auto and pick-up trucks. Although landfill traffic will increase the current traffic load on Route 191 and Howie Road, the overall augmentation is not expected to be substantially significant.

8) Demands on Environmental Resources of Water, Air and Energy - Operation of any landfill site requires the consumption of energy for site maintenance, particularly equipment fuels. Energy consumption associated with the operation and maintenance of a solid waste landfill is directly related to the use of heavy equipment. Heavy equipment scheduled to be utilized includes packer trucks for solid waste transport, scrapers for excavation of waste pits and dozers/track loaders for compaction and coverage of deposited waste.

Diesel fuel will be consumed in the operation of the above-

listed equipment. The energy demand as a result of this project is not site specific. It is estimated that nearly the same amount of energy would be required regardless of the location of the site. The only feasible reduction of energy would require that the landfill site be located closer to town. Locating the site closer to town would unfortunately result in other negative impacts. In the case of the proposed landfill site, the use of fuels will be offset by closure of the existing site located near Big Timber.

9) Historical and Archaeological Sites - The State Historic Preservation Office currently has no record of any known sites of historical or archaeological significance on or near the proposed landfill site.

II. Potential Impact on Human Environment

4) Agricultural and Industrial Production - The proposed landfill site is currently used for grazing by domestic livestock. Once the landfill operation begins, this land will no longer be available as pasture until the site has been abandoned and reclaimed. No significant impact is anticipated as a result of this temporary loss of pasture for grazing by livestock.

9) Demands for Government Services - Operation of a landfill site requires increasingly greater manpower as time passes. Demands for government services are anticipated to increase over the next several years as new regulations governing sanitary landfills become effective. It is incumbent upon state officials to inspect the facility to insure operation is in compliance with local, state, and federal laws. Decision and policy making processes will require governmental involvement, as will licensing procedures. The impact is minimal, however as new regulations will apply to all existing landfill facilities as well, regardless of their location. Since the City currently operates the existing landfill site, which will be closed, the proposed landfill will have no additional impact on the demand for these services.

Heavy units hauling solid waste from the city to the landfill site will place an extra burden on access roads to the proposed site. It is expected that road repair and maintenance will increase as a result. Governmental funds and personnel will be required to perform needed road work.

It should be noted that the above-listed government services would be required for any landfill licensed and operated by Big Timber. The impacts are, therefore, general and not site specific.

Once packer trucks have collected solid waste from individual homes and businesses, they will travel approximately

1 mile north on route 191 and 2-1/2 miles east on Howie Road, which is a narrow gravel road. A bridge is located near the entrance to the proposed landfill. The City has stated that the road and bridge will support the load vehicles that will be utilized. The City will be required to obey any load limits set for that road. Also if the increase in road traffic creates a safety hazard, improvements in Howie Road may be necessary.

10) Industrial and Commercial Activity - The proposed landfill will provide legal and environmentally sound solid waste disposal option for all industrial and commercial establishments doing business in the City of Big Timber. This would be a improvement over the present landfill which is being operated without a license.

REFERENCES

Chen-Northern, Inc., 1990a. Hydrogeologic Investigation Report Proposed Big Timber Landfill Site Big Timber, Montana. Report to the City of Big Timber, January 9, 1990.

Chen-Northern, Inc., 1990b. Report of Additional Hydrologeologic Investigations Proposed Big Timber Landfill Site Big Timber, Montana. Report to the City of Big Timber, August 3, 1990.

Damschen & Associates, Inc., 1990. Big Timber Sanitary Landfill Operation Plan and License Application. February 28, 1990.

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proposed

RECEIVED

OCT 11 1990

MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID & HAZARDOUS WASTE BUREAU

Huntington & Fenter
Gene Huntington
P.O. Box 364
Helena, Montana 59624
442-8099

October 11, 1990

Mr. Tony Grover
Solid Waste Unit
Department of Health and Environmental Sciences
Capitol Station
Helena, Montana 59620

Dear Tony,

We recently met with officials from the City of Big Timber and Barry Damschen to work on a schedule for selling the bonds for the Big Timber landfill. The schedule is predicated on the assumption that the environmental assessment period will begin by October 19, based on our recent conversation. This schedule would allow us to cancel the bond sale if DHES were to indicate that significant public opposition had been voiced during the environmental assessment period.

The proposed schedule is as follows:

- **November 19,** approve Notice of Sale (at regular Council meeting)
- **December 3**, last day to cancel sale
- **December 18**, hold bid opening for bonds and approve sale (requires special Council meeting)
- **January 23**, Closing and settlement of bond sale

As I indicated earlier, we do not have to have the license in hand to sell the bonds, but we do need an indication that the State sees no significant barriers to the issuance of the license and that the process is proceeding as expected.

Please let me know if you see any problem with this schedule.

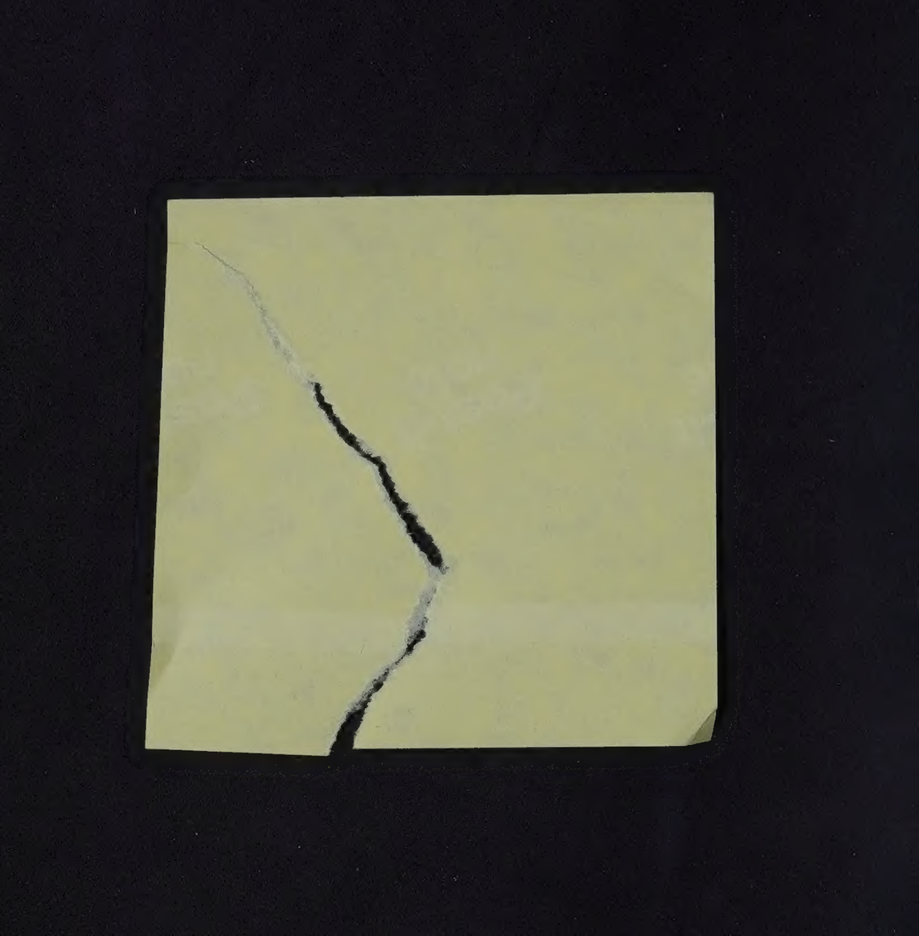
Sincerely,

Gene

Gene Huntington

cc James Devenny
Barry Damschen
Dorsey & Whitney

Reply To No D



File: Sweetgrass
Big Timber - New
L.F. License. Application.

D&A
DAMSCHEN & ASSOCIATES, INC.
CONSULTING ENGINEERS
2030 11TH AVENUE • SUITE 11
P.O. BOX 4817 • HELENA, MT 59604
TELEPHONE (406) 449-8627

August 6, 1990

Tony Grover
Department of Health & Environmental Sciences
Solid and Hazardous Waste Bureau
Helena, MT 59620

RECEIVED
AUG 7 1990
MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID & HAZARDOUS WASTE BUREAU

Dear Tony:

In response to your letter dated June 28, 1990 regarding the Big Timber landfill application, we have conducted additional investigation and analysis and are hereby responding to your comments on behalf of the Mayor and City Council.

Item 1) Handling of Asbestos

If any asbestos is hauled to the site, the City has designated the southern area of Trench IX for the disposal of this material. Soil will be excavated and immediately placed back over the asbestos at the time any loads are brought to the site.

Item 2) Insurance

The City does carry general liability insurance through the Montana Municipal Insurance Authority. Like all entities it is practically impossible to obtain insurance for pollution from a landfill site and their policy correspondingly excludes this item. If you have any specific questions regarding the City's coverage, we encourage you to contact Mr. Bob Worthington (the City's insurance representative). His telephone number here in Helena is 443-0907. We are also attaching a letter from Mr. Worthington on this subject.

Item 3) "Open Burning:

The City does plan to utilize a burn pit to stockpile untreated wood and tree trimmings. The pit will be located in the southern end of Trench V. The City will monitor the dumping of wastes into the pile to make sure that unauthorized materials are not placed in this area. The City will periodically obtain a burning permit from the appropriate officials prior to burning the wastes in the area.

Item 4) "Gas Line"

The City uncovered the pipe line at the two proposed road crossings (Stations 10+00 and 15+00). The current soil cover in these areas is 27 inches and 19 inches respectively. According to the Conoco Pipeline Company, a minimum of 36" of cover will be needed over these roads. The City will construct these roads within these guide lines. Please see attached correspondence from the pipeline company.

Item 5 & 6) "Hydrogeologic Conditions"

The City retained Chen-Northern to conduct additional hydrogeologic testing at the site in response to your letter. This work basically consisted of drilling two additional monitoring wells, taking soil samples, conducting slug test and remeasuring the water depths in the original monitoring wells. We have attached a copy of their report for your review.

Item 8) General Comments

a) See attached Chen-Northern report

b) All surface water that is generated within the planed waste areas will flow by gravity into a detention pond. The contours of these ditches are depicted on Sheet 4 of the plans. As indicated on this plan sheet, all ditches have positive drainage from north to south and the slopes of the ditches vary depending upon the exact location of the ditch. The pond is designed to handle the 25 year storm event. A spillway is designed to handle any additional flow that may occur. The pond is six feet deep and is on the average 60' wide and 110' long.

Any additional storm water generated outside of the active landfill area will be diverted around the site using ditches that will be constructed on the uphill side of the access roads. The final slopes of these ditches will be determined at the time that these roads are constructed.

In regard to the detection and control of leachate, the operation plan (Paragraph 5 of Page 5 of the application booklet) indicates the following:
"In order to detect and collect any leachate that may be generated in the most effective and economical method possible, the operation plan has been developed such that the base elevation of the various trenches slope in a down gradient direction towards the south side of the landfill. If any leachate is generated to the degree that containment and collection is needed, a collection system could be installed along the southern end of each trench."

To follow up on your comment and to detect any leachate that may be generated, the City could install a witness pipe (12" PVC perforated pipe in the extreme southern end of each

trench) and periodically inspect the pipe for any liquid accumulation.

c) We remeasured the depths to ground water in all the wells and found that the depths have not changed appreciably (See Chen-Northern report). It would be ideal if several years of data were available, however in a project such as this the City does not have the luxury of owning the site for a long period of time without developing and using it. The two measuring periods do indicate that the seasonal fluctuation of the ground water is not excessive and is significantly deep to meet the limits of the regulations.

d) We are not sure what calculations should be presented and we would correspondingly be happy to open our files to you for your review. We are enclosing some of Chen-Northern's calculations.

e) See attached Chen-Northern report.

Item 9) See response in Item 8(b).

Item 10) See response in Item 8(b).

Item 11) Closure Plan

It is the intent of the City to excavate and fill the trenches in the order established on the sequence plan (Sheet 3). It is also the intent to fill each trench to the final elevation as specified on the Final Contour Plan (Sheet 4) as well as place the final cover soil (2.5 feet deep) prior to filling waste in the next trench. By conducting the filling operation in this manor, the final closure plan is being implemented as the landfill is being filled. (If you need additional information or details to meet your closure plan requirements, please contact me.)

On behalf of the City of Big Timber, we hope that this information answers any questions that you may have. If you have any further questions please call me at your earliest convenience.

Very truly yours,

DAMSCHEN & ASSOCIATES, INC.

Barry E. Damschen, P.E.
Project Manager

Enclosures (3)

cc: City of Big Timber

Montana Municipal Insurance Authority

August 3, 1990

Mr. John Jacobs
City Clerk
City of Big Timber
P.O. Box 416
Big Timber, Mont. 59011

RE: PROOF OF LIABILITY INSURANCE

Dear John:

You requested that I provide you with information concerning liability insurance coverage for the City of Big Timber. You indicated that this information is to be included in the development documents necessary for a landfill application.

The City of Big timber is a member of the Liability Risk Retention Program of the Montana Municipal Insurance Authority (MMIA). The MMIA is a risk-retention organization providing coverage exclusively to Montana municipalities. I have attached a copy of the current (July 1, 1990) Memorandum of Coverage as well as the Declarations Page for the City of Big Timber.

Please note in the Memorandum, Page 6, IX. Exclusions, A., 2., "Any liability arising out of the actual, alleged or threatened discharge, dispersal, release or escape of Pollutants:. . . " The Memorandum of Coverage should be reviewed for a complete understanding of coverage and exclusions relating to pollution as it relates to landfill operations.

I hope that this information will resolve the insurance questions and assist you in your development process. If I can be of further assistance do not hesitate to contact me.

Sincerely,

Bob Worthington
MMIA Insurance Coordinator

enclosures

cc: Barry Damschen - Damschen & Associates

MAIN OFFICE: P.O. Box 1704, Helena, Montana 59624 (406) 442-8768
INSURANCE COORDINATOR: P.O. Box 785, Helena, Montana 59624 (406) 443-0907 In MT: 1-800-635-3089

Montana Municipal Insurance Authority

MEMORANDUM OF LIABILITY COVERAGE

COPY

MEMORANDUM #
L-0079-90

DECLARATIONS

ENTITY COVERED: CITY OF BIG TIMBER MONTANA

MAILING ADDRESS: P.O. BOX 416
BIG TIMBER, MONT. 59011

COVERAGE PERIOD: FROM: JUL 1, 1990 TO: JUL 1, 1991 12:01 A.M.

DEPOSIT PREMIUM: $5,838.00

DEDUCTIBLE: $ 500.00 PER OCCURRENCE

MAXIMUM POLICY LIMIT:

(a) $750,000 for an Occurrence which arises or derives from injury to or death of a single person, or damage to property of a single person, regardless of the number of persons or entities claiming damages thereby.

(b) $1,500,000 for each Occurrence which does not fall under (a) above.

Endorsements Attached:

By ______________________
MMIA Authorized Representative

COPY

MEMORANDUM OF LIABILITY COVERAGE FOR THE MONTANA MUNICIPAL INSURANCE AUTHORITY

EFFECTIVE July 1, 1990.

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COPY

MEMORANDUM OF LIABILITY COVERAGE FOR THE MONTANA MUNICIPAL INSURANCE AUTHORITY EFFECTIVE July 1, 1990.

In consideration of the payment of the premium, the Montana Municipal Insurance Authority (Authority) agrees to pay on behalf of the named insured in the DECLARATIONS (the Entity) as follows:

I. COVERAGE

Subject to the LIMITS OF LIABILITY, EXCLUSIONS, CONDITIONS and other terms of this Memorandum, the Authority agrees to pay on behalf of the Entity all sums in excess of the DEDUCTIBLE which the Entity shall become legally obligated to pay as Damages because of:

A. Bodily Injury or Property Damage

B. Personal Injury

C. Public Officials Errors and Omissions

as those terms are herein defined and to which the Memorandum applies, caused by an Occurrence during the COVERAGE PERIOD.

II. DEFENSE, JUDGMENT AND SETTLEMENT

The Authority shall have the right and duty to defend any suit against the Entity claiming monetary damages for which coverage is afforded under this Memorandum for an Occurrence during the COVERAGE PERIOD, even if any of the allegations of the suit are groundless, false, or fraudulent, and may make such investigation and settlement of any claim or suit as it deems expedient. The Authority's duty to defend shall arise when the complaint or claim alleges facts which would obligate the Authority to indemnify the insured if the alleged facts were proven. The Authority shall be responsible for payment of all reasonable attorney fees and costs for defense of a COVERED PARTY and shall only be responsible for payment of that portion of a settlement or judgment which relates to claims for which coverage is afforded under the terms of this Memorandum. Provided, however, the Authority shall not be obligated to pay any settlement or judgment or to defend any suit after the applicable LIMITS OF LIABILITY have been exhausted by payment of settlements or judgments.

F. "Covered Party" -- means any person or Entity set forth in Section III of this Memorandum.

G. "Dam" -- means any artificial barrier, together with appurtenant works, used to impound or divert water with an impounding capacity of 50 acre feet or greater, and shall include a barrier designated as a "high hazard dam" pursuant to Montana Code Annotated Sections 85-15-106 and 85-15-209.

H. "Damages" -- means Loss and Defense Costs.

I. "Defense Costs" -- means all fees and expenses caused by and relating to the adjustment, investigation, defense or appeal of a claim seeking monetary damages for which coverage is afforded under this Memorandum, including attorney fees, court costs and interest on judgments accruing after entry of judgment. However, Defense Costs shall not include the office expenses or salaries of employees or officials of the Authority or any Entity nor expenses of claims administrators engaged by any Entity.

J. "Entity" -- means the city or town named in the DECLARATIONS, including any and all commissions, agencies, districts, authorities, councils or similar entities coming under the Entity's direction or control or for which the Entity's council members sit as the sole governing body.

K. "Loss" -- means the sum actually paid or payable in cash in the settlement or satisfaction of losses for which the Entity is liable either by adjudication or by compromise after making proper deduction for all recoveries and salvages.

L. "Memorandum" -- means this Memorandum of Liability Coverage for the Montana Municipal Insurance Authority and any endorsements attached thereto.

M. "Nuclear Material" -- means source material, special nuclear material, or by-product material. Source material, special nuclear material and by-product material have the meanings given to them by the Atomic Energy Act of 1954 or in any law amendatory thereto.

N. "Occurrence" -- means:

1. With respect to Bodily Injury or Property Damage, an accident or event which results during the COVERAGE PERIOD, in Bodily Injury or Property Damage neither expected nor intended from the standpoint of the COVERED PARTY, or an assault or battery committed by, at the direction of, or with the consent of the COVERED PARTY for the purpose of protecting persons from injury, death, or Property Damage;

2. Loss of use of tangible property that is not physically injured provided such loss of use is caused by an Occurrence during the COVERAGE PERIOD.

R. "Public Officials Errors and Omissions" -- means any act, omission, neglect or breach of duty, including nonfeasance, misfeasance, and malfeasance by the COVERED PARTY, but shall not mean or include Bodily Injury, Personal Injury, or Property Damage.

S. "Special Event"--means an event of leisure, sports, recreation, entertainment, or public interest value lasting a specific period of time.

VI. DEDUCTIBLE

The obligation of the Authority to pay Damages on behalf of the Entity shall apply only to the amount of Loss and Defense Costs in excess of the DEDUCTIBLE amount stated in the DECLARATIONS. The DEDUCTIBLE amount so stated applies on a per Occurrence basis to all Loss and Defense Costs caused by an Occurrence.

The terms of the Memorandum, including those with respect to the Authority's rights and duties for the defense of suits, apply irrespective of the application of the DEDUCTIBLE amount.

The Authority may pay any part or all of the DEDUCTIBLE amount to effect a settlement of any claim or suit, and upon notification of the action, the Entity shall promptly reimburse the Authority for such part of the DEDUCTIBLE amount as has been paid by the Authority.

VII. LIMIT OF LIABILITY

The Authority's liability for Damages as the result of any one Occurrence shall be only the MAXIMUM POLICY LIMIT less the amount of the Entity's DEDUCTIBLE as specified in the DECLARATIONS.

For the purpose of determining the LIMIT OF LIABILITY, all Damages arising out of continuous or repeated exposure to substantially the same general conditions shall be considered as arising out of one Occurrence.

In the event that any combination of the COVERAGES applies to the same Entity for a Loss, claim or suit, the Authority's liability shall be limited to the LIMIT OF LIABILITY for one Occurrence.

c. Which are at any time transported, handled, stored, treated, disposed of, or processed as waste by or for the Entity or any person or organization for whom the Entity may be legally responsible; or from any site or location on which the Entity or any contractors or subcontractors working directly or indirectly on the Entity's behalf are performing operations:

   (1) If the Pollutants are brought on or to the site or location in connection with such operations; or

   (2) If the operations are to test for, monitor, clean up, remove, contain, treat, detoxify, or neutralize the Pollutants.

   This exclusion does not apply, however, to Bodily Injury or Property Damage caused by heat, smoke, or fumes from a hostile fire. As used in this exclusion, a hostile fire means one which becomes uncontrollable or breaks out where it was not intended to be.

3. Any Loss, cost or expense arising out of any governmental directions or request that the Entity test for, monitor, clean up, remove, contain, treat, detoxify or neutralize Pollutants.

4. Any liability arising out of unlawful discrimination, wrongful termination or the violation of civil rights of any employee or official of the Entity.

5. Bodily Injury to an employee of the Entity arising out of and in the course of employment by the Entity, or for the spouse, child, parent, brother or sister of that employee as a consequence of actions of the employee arising out of and in the course of employment by the Entity.

   This exclusion applies whether the Entity may be liable as an employer or in any other capacity, except with respect to liability of others assumed under contract.

6. Any obligation for which the Entity or any insurance company as its insurer may be held liable under any workers' compensation or disability benefits law or any similar law.

or civil rights related thereto, regardless of whether such claims are made directly against the Entity or pursuant to an agreement entered into by or on behalf of the Entity.

14. Any liability arising out of the operation of any transit authority, transit system, or public transportation system owned or operated by the Entity, except a transit system operating over non-fixed route systems such as dial-a-ride, senior citizen transportation, or handicapped transportation.

15. Any liability arising out of the failure to supply or provide an adequate supply of gas, water or electricity when such failure is a result of the inadequacy of the Entity's facilities to supply or produce sufficient gas, water or electricity to meet the demand.

16. Any liability for Bodily Injury or Property Damage arising out of the hazardous properties of Nuclear Material.

17. Any liability arising out of sexual abuse, mistreatment, or harassment.

18. Any liability arising out of the following Special Events:

    a. Air shows;

    b. Circuses;

    c. Rodeos;

    d. Fireworks;

    e. Animal racing;

    f. Carnivals;

    g. Vehicle racing;

    h. Rock concerts;

    i. Water sports other than the operation of municipal swimming pools, lakes or other designated swimming areas;

    j. Boxing or other martial arts;

    k. Skateboard exhibition, competition, or racing.

26. Any liability arising out of estimates of probable costs or cost estimates being exceeded or faulty preparation of bid specifications or plans including architectural plans or failures to award contracts in accordance with a statute or ordinance which under law must be submitted for bids.

27. Any liability arising out of failure to perform, or breach of, a contractual obligation.

28. The Employee Retirement Income Security Act of 1974, and any law amendatory thereof, or similar provisions of any federal, state, or local statutory law or common law.

29. Any claim based on or arising out of a notarized certification of a signature without the physical appearance before such notary public.

30. Any claim for Property Damage arising solely out of an act of vandalism, theft or other criminal act.

31. Any claim arising out of Property Damage to personal property loaned to the Entity for temporary use or claim arising out of Property Damage to personal property, belonging to another, but stored by the Entity, with or without charge. However, this exclusion does not apply to (a) property of persons who are involuntarily confined by the Entity, or (b) property held as evidence or otherwise seized or impounded by the Entity; provided that in either the case of (a) or (b), above, the property has been accurately recorded by the Entity and is reasonably secured by the Entity.

32. Any liability arising out of the use of a structure designed to facilitate the operation or use of a skateboard, whether or not the structure is utilized for skateboarding purposes.

X. CONDITIONS

A. Payment of Premium.

The Entity agrees to pay all risk premiums, risk premium adjustments, deferred risk premium adjustments, debt service premiums and supplemental debt service premiums as specified in the Liability Insurance Protection Program Agreement.

E. Other Insurance.

If the COVERED PARTY has collectible insurance for Damages also covered hereunder (whether primary, excess, contributory, contingent or otherwise), the coverage provided by this Memorandum shall be in excess of such other insurance. This clause does not apply with respect to excess insurance purchased specifically to be in excess of this Memorandum.

F. Reimbursement to Entity.

In the event the Authority has paid any amounts in settlement or satisfaction of claims, judgments, or awards, including interest, or for claim expenses in excess of the applicable LIMITS OF LIABILITY, or within the amount of the applicable DEDUCTIBLE, or if the Authority in good faith has paid any amounts for which the Authority has no liability under this Memorandum, the Entity shall be jointly and severally liable to the Authority for any and all such amounts and, upon demand, shall pay such amounts to the Authority.

G. Occurrence.

An Occurrence with a duration of more than one COVERAGE PERIOD shall be treated as a single Occurrence arising during the COVERAGE PERIOD when the Occurrence began.

H. Opportunity to Remedy in Event of Breach.

In the event the Authority considers the Entity in breach of a term or condition of this Memorandum, the Interlocal Agreement Creating the Montana Municipal Insurance Authority, or the Liability Insurance Coverage Program Agreement, the Authority shall first give notice to the Entity of the alleged breach and allow the Entity the opportunity to remedy the same. In the event the Entity considers the Authority in breach of a term or condition of this Memorandum, the Interlocal Agreement Creating the Montana Municipal Insurance Authority, or the Liability Insurance Coverage Program Agreement, the Entity shall first give notice to the Authority of the alleged breach and allow the Authority the opportunity to remedy the same.

I. Cancellation.

This Memorandum may be cancelled by the Authority for non-payment of premium in accordance with Article VI, Section 6.4 of the Liability Insurance Coverage Program Agreement. The Authority shall mail written notice to the Entity at the address shown in this Memorandum stating when such cancellation shall be effective.

M. Notice.

Notice to any agent or knowledge possessed by any agent or by any other person shall not effect a waiver or change in any part of this Memorandum or stop the Authority from asserting any right under the terms of this Memorandum, nor shall the terms of this Memorandum be waived or changed, except by endorsement issued to form a part hereof.

N. Memorandum to Conform to Statutes, Case Law, Regulations, Rules.

Any and all provisions of this Memorandum which are in conflict with the statutes, case law, regulations, or rules of the United States or the State of Montana wherein this Memorandum is issued are understood, declared and acknowledged by the Authority to be amended to conform to such statutes, case law, regulations, or rules.

O. Entire Contract.

By acceptance of this Memorandum, the Entity agrees that the Entity's statements in the MMIA Exposure Survey, in the DECLARATIONS, and in the application for this Memorandum are true and correct, and the MMIA Exposure Survey, DECLARATIONS, and application form a part of this Memorandum, that this Memorandum is issued in reliance upon the truth of such representations, and that endorsements issued by the Authority are a part of this Memorandum. The Memorandum, together with the Interlocal Agreement Creating the Montana Municipal Insurance Authority and Liability Insurance Coverage Program Agreement, embody all agreements and constitute the entire contract existing between the Authority and the Entity pertaining to this insurance.

CERTIFIED MAIL - SIGNED RECEIPT REQUESTED

RE: Road To New LandFill Site

Dear John:

Please understand that Conoco Pipe Line Company (Conoco) is the pipeline operator for the Yellowstone Pipeline Co.. In response to our July 25, 1990 telephone conversation regarding construction requirements for the above referenced property, note the attached copy of Conoco's Right of Way Development Provisions (Provisions), DOT regulations 195.210 and 195.248, and HUD information. The current depth of the pipeline cover in your development area can be obtained from:

Gary BurBank
333 Hwy 87 E.
Billings, MT. 59101

255-5641

YPL operates a 10-inch high pressure liquid petroleum pipeline which passes through a portion of the development. The pipeline is operated in accordance with Title 49, Part 195 of the Code of Federal Regulations, Transportation and are administered by the Department of Transportation (DOT). Your compliance to the Provisions is required to avoid construction on or near YPL's pipeline that would result in non-compliance with DOT regulations, potential hazard to the public, or impaired access to inspect and maintain YPL's pipeline. Enclosed are DOT regulations 195.210 entitled "Pipeline Location" and 195.248 entitled "Cover Over Buried Pipeline", which makes direct references to necessary minimum distances from and cover over pipelines. Also, per the attached, please note that the Department of Housing and Urban Development (HUD) requires that a developer complies with Part 195.210 and 195.248 in order to obtain financing for construction property close to pipelines.

The Provisions require that no building or permanent structures be constructed within 50 feet of the pipeline centerline. The Provisions also outline requirements for road and utility crossings. If modifications to the pipeline are needed, the Provisions require 100% prepayment of a construction cost estimate to complete the modifications. However, the developer is ultimately responsible for the actual costs incurred by YPL to modify the pipeline.

When you have finalized your plans for the proposed development, please send me copies of the final construction drawings and I will prepare a preliminary cost estimate of the modifications which may be necessary.

If you have any questions, please call me at (303) 649-4034.

Very truly yours,

FOR
Ernest E. Woods
Environmental Analyst

F:EEW/lmj/28

cc: District Manager
P. V. Henehan
District Superintendent
Facility Supervisor

CONOCO PIPE LINE COMPANY
RIGHT-OF-WAY DEVELOPMENT PROVISIONS

1. Conoco Pipe Line (hereinafter referred to as "Company") maintains its pipelines in accordance with industry standards for safe operations. Should a Developer/Landowner (hereinafter referred to as "Developer") propose plans to alter the area through which Company lines pass, causing the lines not to meet these standards, modifications to the lines will be made. The cost of such modifications will be borne by the Developer.

2. No buildings, engineering works, deep rooted plants, septic systems, or other similar permanent structures will be allowed over any portion of our easement.

3. Roads overlying the lines will be allowed only with Developer's execution of a hold harmless agreement which releases Company from all damages to the asphalt and concrete associated with any maintenance performed on Company line. All roads passing over Company pipelines where the pipeline depth is less than 48 inches (including borrow ditches) will require the installation of concrete coating around our lines for the entire length which lies under the road. In addition, it may be necessary to lower or reroute the lines at the point of crossing to insure that they are not subjected to excessive stress from movement of traffic. Any such modification to the lines will be made at Developer's expense.

4. At any point in the easement where the existing grade profile will be lowered by the removal of earth, Company lines must be lowered to a depth which provides a minimum cover of 36 inches (residential areas may require 48 inches) after final grading. Any lowering which is necessary shall be done at Developer's expense and shall include coating and wrapping the entire exposed portion of line.

5. Construction of concrete parking lots over the lines will not be allowed. Asphalt parking lots overlying the lines will be allowed only with Developer's execution of a hold harmless agreement which releases Company from all damages to the asphalt associated with any maintenance performed on our line.

6. All utilities which cross Company lines must pass underneath existing lines by a minimum of 12 inches (18 inches preferred), and the crossing shall be as close to 90 degrees as possible and adequately marked on both sides of the pipeline. The markers shall be maintained in the future. Any future relocation of the utility line due to Company's pipeline maintenance shall be done at the Developer's expense. If there are specific instances for which gravity flow utilities will not be able to comply with this requirement, please provide an accurate description of the proposed utility and the Company will be willing to discuss possible alternate solutions. Telephone cables, electric cables, and PVC gas lines must be encased in a steel conduit and covered with a red concrete casing 10 feet on both sides of the pipeline. Any utilities which parallel Company lines will maintain a minimum separation distance of 25 feet from the utility's outside wall to the Company's pipeline outside wall.

7. If any lines crossing Company lines are installed and constructed of a material requiring cathodic protection, an interference survey shall be made and necessary steps will be taken to prevent the sacrifice of either line. This will be done at Developer's expense.

8. The Developer will allow no material or equipment to be used in the construction which would hinder or impair Company's ability to safely maintain and operate Company lines.

9. The Company retains the right to adequately mark Company pipelines with permanent line markers to insure public safety and the future safe operation of the lines.

10. This office must be provided with construction drawings for all work which will affect our pipeline easement, including a present plat and a profile (along the pipeline centerline) showing any grade work to be done. Upon receipt of these drawings the Company will prepare a cost estimate of any modifications to our lines which will be necessary.

11. Before proceeding with construction, Company requires that 100% of the cash equivalent of Company cost estimate be given to the Company prior to construction. You will be charged actual costs for design/construction as incurred by the Company and an overhead charge to cover procurement, accounting, and legal services, whether higher or lower than our estimated costs. Any part of the cost estimate not spent will be returned to the Developer or the Developer will be invoiced for amounts exceeding the cost estimates. Any construction work which is required shall be done by one of the Company's maintenance contractors or another contractor acceptable to both parties. The Company reserves the right to have an inspector on the job to oversee all construction within our easement.

12. The Company requires a minimum of ten days written notice prior to any excavation, construction, or movement of equipment across our right of way so that Company lines can be staked to minimize the possibility of accidental damage. In the event that construction is necessary, the Company shall be indemnified and held harmless from and against any and all claims for injuries to person or persons or for damages to property arising directly or indirectly from work to be performed by the Developer or those under contract to the Developer.

13. No permanent structure will be built within 50 feet of Company line without prior approval from Company.

14. Developer requesting Company to restrict the easement width will have a centerline survey of the line completed across his land by a registered land surveyor at the Developer's expense. The Developer will provide proof of ownership of the property (i.e., warranty deed).

Subpart D—Construction

§ 195.200 Scope.

This subpart prescribes minimum requirements for constructing new pipeline systems with steel pipe, and for relocating, replacing, or otherwise changing existing pipeline systems that are constructed with steel pipe. However, this subpart does not apply to the movement of pipe covered by § 195.424.

§ 195.202 Compliance with specifications or standards.

Each pipeline system must be constructed in accordance with comprehensive written specifications or standards that are consistent with the requirements of this part.

§ 195.204 Inspection—general.

Inspection must be provided to ensure the installation of pipe or pipeline systems in accordance with the requirements of this subpart. No person may be used to perform inspections unless that person has been trained and is qualified in the phase of construction he is to inspect.

§ 195.206 Material inspection.

No pipe or other component may be installed in a pipeline system unless it has been visually inspected at the site of installation to ensure that it is not damaged in a manner that could impair its strength or reduce its serviceability.

§ 195.208 Welding of supports and braces.

Supports or braces may not be welded directly to pipe that will be operated at a pressure of more than 100 p.s.i.g.

§ 195.210 Pipeline location.

(a) Pipeline right-of-way must be selected to avoid, as far as practicable, areas containing private dwellings, industrial buildings, and places of public assembly.

(b) No pipeline may be located within 50 feet of any private dwelling, or any industrial building or place of public assembly in which persons work, congregate, or assemble, unless it is provided with at least 12 inches of cover in addition to that prescribed in § 195.248.

§ 195.212 Bending of pipe.

(a) Pipe must not have a wrinkle bend.

(b) Each field bend must comply with the following:

(1) A bend must not impair the serviceability of the pipe.

(2) Each bend must have a smooth contour and be free from buckling, cracks, or any other mechanical damage.

(3) On pipe containing a longitudinal weld, the longitudinal weld must be as near as practicable to the neutral axis of the bend unless-

(i) The bend is made with an internal bending mandrel; or

(ii) The pipe is 12 inches or less in outside diameter or has a diameter to wall thickness ratio less than 70.

(c) Each circumferential weld which is located where the stress during bending causes a permanent deformation in the pipe must be nondestructively tested either before or after the bending process.

§ 195.214 Welding: General.

(a) Welding must be performed by a qualified welder in accordance with welding procedures qualified to produce welds meeting the requirements of this subpart. The quality of the test welds used to qualify the procedure shall be determined by destructive testing.

(b) Each welding procedure must be recorded in detail, including the results of the qualifying tests. This record must be retained and followed whenever the procedure is used.

[Amdt. 195-38, 51 FR 20297, June 4, 1986]

§ 195.216 Welding: Miter joints.

A miter joint is not permitted (not including deflections up to 3 degrees that are caused by misalignment).

§ 195.222 Welders: Qualification of welders.

Each welder must be qualified in accordance with section 3 of API Standard 1104 or section IX of the ASME Boiler and Pressure Vessel Code, except that a welder qualified under

designated commercial areas, industrial facilities, public institutions, and places of public assembly.

(f) When installing used pipe, 100 percent of the old girth welds must be nondestructively tested.

(g) At pipeline tie-ins 100 percent of the girth welds must be nondestructively tested.

[Amdt. 195-22, 46 FR 38360, July 27, 1981, as amended by Amdt. 195-35, 50 FR 37192, Sept. 21, 1985]

§ 195.236 External corrosion protection.

Each component in the pipeline system must be provided with protection against external corrosion.

§ 195.238 External coating.

(a) No pipeline system component may be buried or submerged unless that component has an external protective coating that—

(1) Is designed to mitigate corrosion of the buried or submerged component;

(2) Has sufficient adhesion to the metal surface to prevent underfilm migration of moisture;

(3) Is sufficiently ductile to resist cracking;

(4) Has enough strength to resist damage due to handling and soil stress; and

(5) Supports any supplemental cathodic protection.

In addition, if an insulating-type coating is used it must have low moisture absorption and provide high electrical resistance.

(b) All pipe coating must be inspected just prior to lowering the pipe into the ditch or submerging the pipe, and any damage discovered must be repaired.

§ 195.242 Cathodic protection system.

(a) A cathodic protection system must be installed for all buried or submerged facilities to mitigate corrosion that might result in structural failure. A test procedure must be developed to determine whether adequate cathodic protection has been achieved.

(b) A cathodic protection system must be installed not later than 1 year after completing the construction.

§ 195.244 Test leads.

(a) Except for offshore pipelines, electrical test leads used for corrosion control or electrolysis testing must be installed at intervals frequent enough to obtain electrical measurements indicating the adequacy of the cathodic protection.

(b) Test leads must be installed as follows:

(1) Enough looping or slack must be provided to prevent test leads from being unduly stressed or broken during backfilling.

(2) Each lead must be attached to the pipe so as to prevent stress concentration on the pipe.

(3) Each lead installed in a conduit must be suitably insulated from the conduit.

§ 195.246 Installation of pipe in a ditch.

(a) All pipe installed in a ditch must be installed in a manner that minimizes the introduction of secondary stresses and the possibility of damage to the pipe.

(b) All offshore pipe in water at least 12 feet deep but not more than 200 feet deep, as measured from the mean low tide, must be installed so that the top of the pipe is below the natural bottom unless the pipeline is supported by stanchions, held in place by anchors or heavy concrete coating, or an equivalent level of protection is provided.

§ 195.248 Cover over buried pipeline.

(a) Unless specifically exempted in this subpart, all pipe must be buried so that it is below the level of cultivation. Except as provided in paragraph (b) of this section, the pipe must be installed so that the cover between the top of the pipe and the ground level, road bed, river bottom, or sea bottom, as applicable, complies with the following table:

Location	Cover (inches)	
	For normal excavation	For rock excavation [1]
Industrial, commercial, and residential areas	[illegible]	30

Location	Cover (inches)	
	For normal excavation	For rock excavation [1]
Crossings of inland bodies of water with a width of at least 100 ft from high water mark to high water mark	48	18
Drainage ditches at public roads and railroads	36	36
Deepwater port safety zone	48	24
Other offshore areas under water less than 12 ft-deep as measured from the mean low tide	36	18
Any other area	30	18

[1] Rock excavation is any excavation that requires blasting or removal by equivalent means.

(b) Less cover than the minimum required by paragraph (a) of this section and § 195.210 may be used if—

(1) It is impracticable to comply with the minimum cover requirements; and

(2) Additional protection is provided that is equivalent to the minimum required cover.

[Amdt. 195-22, 46 FR 38360, July 27, 1981; 47 FR 32721, July 29, 1982]

§ 195.250 Clearance between pipe and underground structures.

Any pipe installed underground must have at least 12 inches of clearance between the outside of the pipe and the extremity of any other underground structure, except that for drainage tile the minimum clearance may be less than 12 inches but not less than 2 inches. However, where 12 inches of clearance is impracticable, the clearance may be reduced if adequate provisions are made for corrosion control.

§ 195.252 Backfilling.

Backfilling must be performed in a manner that protects any pipe coating and provides firm support for the pipe.

§ 195.254 Above ground components.

(a) Any component may be installed above ground in the following situations, if the other applicable requirements of this part are complied with:

(1) Overhead crossings of highways, railroads, or a body of water.

(2) Spans over ditches and gullies.

(3) Scraper traps or block valves.

(4) Areas under the direct control of the operator.

(5) In any area inaccessible to the public.

(b) Each component covered by this section must be protected from the forces exerted by the anticipated loads.

§ 195.256 Crossing of railroads and highways.

The pipe at each railroad or highway crossing must be installed so as to adequately withstand the dynamic forces exerted by anticipated traffic loads.

§ 195.258 Valves: General.

(a) Each valve must be installed in a location that is accessible to authorized employees and that is protected from damage or tampering.

(b) Each submerged valve located offshore or in inland navigable waters must be marked, or located by conventional survey techniques, to facilitate quick location when operation of the valve is required.

§ 195.260 Valves: Location.

A valve must be installed at each of the following locations:

(a) On the suction end and the discharge end of a pump station in a manner that permits isolation of the pump station equipment in the event of an emergency.

(b) On each line entering or leaving a breakout storage tank area in a manner that permits isolation of the tank area from other facilities.

(c) On each mainline at locations along the pipeline system that will minimize damage or pollution from accidental hazardous liquid discharge, as appropriate for the terrain in open country, for offshore areas, or for populated areas.

(d) On each lateral takeoff from a trunk line in a manner that permits shutting off the lateral without interrupting the flow in the trunk line.

(e) On each side of a water crossing that is more than 100 feet wide from high-water mark to high-water mark unless the Secretary finds in a particular case that valves are not justified.

zones per 24 CFR Part 51B. Lots and/or structures meeting the requirements of 51.104(a) are considered to be acceptable.

i. Locations Near High Pressure Gas and Liquid Petroleum Transportation Pipelines. No part of any residential structure shall be located less than ten feet from the outer boundary of the pipeline easement of high pressure gas and liquid petroleum transmission lines in accordance with CFR Title 49, Parts 192 and 195. When new construction or subdivision land planning is proposed in areas outside the ten foot limit, but within an area that extends 220 yards on either side of the centerline of such high pressure transmission line, the developer shall be required to comply with the following procedure prior to HUD acceptance of applications for commitment on individual properties.

(1) The developer must provide HUD with a statement from an authorized official of the pipeline company certifying compliance with each of the following paragraphs of Title 49, Transportation, of the Code of Federal Regulations.

a 192.607 - Initial determination of class location and confirmation or establishment of maximum allowable operating pressure. ✓

b 192.609 - Required study for change in class location. ✓

c 192.611 - Change in class location: Confirmation or revision of maximum allowable operating pressure. ✓

d 192.613 - Continuing surveillance practices (Identification and operating methods used by survey team.) ✓

e 195.210 - Pipeline location within easement or right of way.

f 195.248 - Depth of cover over buried pipeline.

(2) Pipeline companies maintain records of the above, per agreement with the Department of Transportation as recorded in Federal Register, Volume 35, Number 161, dated August 19, 1970, which has been previously distributed to all Field Offices.

(3) When it is determined that a high pressure gas or liquid petroleum transmission pipeline is within the 220 yard area cited above, from a proposed housing development site it will be incumbent upon the developer to ascertain the depth of the pipeline and determine the acceptable separation distance from the pipeline in accordance with criteria contained in CFR 49 Part 195, and HUD Guidebook "Safety Considerations in Siting Housing Projects".

(4) The above statements obtained by the developer shall be retained in the subdivision file.

NOD

file

ROUTE SLI

DEPARTMENT OF HEALTH & ENVIRONMENTAL SCIENCES

TO:
DATE: June 28, '90

1. RT RCJ
2. DR DKR
3.

☒ Approval
☐ Note and Return
☐ Prepare reply
☐ As requested

☒ Comment
☐ Note and File
☐ Signature
☐ For your information

☐ Necessary Action
☐ Investigate
☐ See Me
☐ Per Conversation

REMARKS:

Please return a copy to me for filing.

FROM: Tony G.

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

STAN STEPHENS, GOVERNOR

FAX #(406) 444-1499

STATE OF MONTANA

OFFICE LOCATION: 836 Front Street
Helena, Montana

MAILING ADDRESS: Cogswell Building
Helena, MT 59620

Solid and Hazardous Waste Bureau
(406) 444-1430

June 28, 1990

James A. Devenny, Mayor
City of Big Timber
P.O. Box 416
Big Timber, MT 59011

Regarding: Class II Landfill Application, City of Big Timber, Montana

Dear Mayor Devenny:

Pursuant to Section 75-10-221 MCA, and ARM 16-14-511, the Department of Health and Environmental Sciences, Solid and Hazardous Bureau, hereby notifies you that your application for Class II, Sanitary Landfill, filed with the Department on March 15, 1990, is incomplete.

The Montana Solid Waste Management Act (SWMA) provides specific criteria by which an application for sanitary landfill is to be provided. In general terms, the Department must be able to determine whether or not the proposed sanitary landfill can and will be operated in compliance with the SWMA and rules promulgated thereunder. In order to make this determination the following additional information is required:

1) Question 19 on the application states that no special or unusual waste will be accepted. Does the landfill facility intend to accept asbestos? If so, what precautions are planned to handle this material?

2) The insurance policy submitted with the application specifically excludes liability arising out of claims "at or from any site or location used by or for the entity or others for the handling, storage, disposed processing, or treatment of waste." Do you intend to obtain insurance coverage for this activity?

3) Question 18 on the application indicates that open burning will be conducted at the landfill facility. The plans do not indicate a specific site for this activity. Additional information about open burning is required.

4) A gas line is known to transect the northern portion of the proposed landfill site. Precautions must be taken to ensure that traffic loads on the access road do not affect the structural integrity of the pipe. Provide operational information and design criteria that will safeguard the gas line.

5) Depth to groundwater in the area to be trenched has not been established. The lack of borings in the area to be trenched combined with the admitted difficulty in correlating water bearing zones allows the possibility that regulatory criteria for waste to water separation has not been met. The absence of correlated zones due to their variable nature raises serious questions about the extent and integrity of the stratigraphic units being used to characterize the site as to permeabilities and water levels. A double-ring infiltrometer can be of limited assistance in characterizing the vertical permeability of a site with very complex lithology. In addition to the limitations of observed groundwater data, 'seasonal high' water levels have not been addressed. Federal regulations pertaining to Class II landfill sites require a 15 foot (consistent with state regulations of 10-20 feet) separation of the landfill trench bottom and the 'seasonal high' water level. The shallow water table near BT-3, the sequence of dry years and variability of the water bearing zones causes concern regarding high seasonal or intermittent water levels at the site.

6) The application states that subsurface materials are, "not conducive to significant groundwater movement." I do not agree because it is difficult to extrapolate parameters across the area where it is admitted that water bearing zones cannot be correlated. The term significant must be quantified.

8) As a result of the above comments I suggest you investigate the following:

   a) At least one additional boring is needed in the trench locations (in the vicinity of the center of trench V) to identify lithology and establish permeabilities for the entire site. An additional boring could be located south of trench III and would serve to provide additional water table and lithologic information. In-situ hydrogeologic testing data from the new wells should be provided.

   b) Surface water control systems and leachate detection and abatement plans need to be discussed in sufficient detail to meet detail requirements of rules.

   c) Water level monitoring must be of sufficient duration to establish a reasonable baseline. Research should be conducted and a discussion of 'seasonal high' or potential high water table levels should be presented.

   d) Raw data and calculations should be provided for review.

    e) Additional discussion regarding horizontal/vertical permeability ratios (kh/kv), subsequent to establishing appropriate permeabilities for the site, would assist in understanding leachate and water migration and the overall suitability of the lithology.

9) Provide dimensions of the detention pond along with calculations establishing that the pond size is adequate for its intended purpose.

10) It is difficult to determine from the plan sheets if the drainage ditch around the trenching area will provide gravity flow to the detention basin. Indicate the slope of the ditch on the plans.

11) A closure plan should be included in the application.

This concludes the Departments review of the Class II Sanitary Landfill Application. Pursuant to ARM 16-14-511, the Department has postponed further processing of the application until the additional information requested in this letter has been provided. If this information is not received within 90 days of the receipt of this letter, a new application must be submitted.

If you have any questions or concerns about this letter of deficiency, please do not hesitate to contact me.

Sincerely,

Tony Grover
Solid Waste Program Manager

cc: Damshcen & Associates

Sweet Grass

D&A
DAMSCHEN & ASSOCIATES, INC.
CONSULTING ENGINEERS
2030 11TH AVENUE • SUITE 11
P.O. BOX 4817 • HELENA, MT 59604
TELEPHONE (406) 449-8627

June 27, 1989

Jim Leiter
Department of Health & Environmental Sciences
Solid & Hazardous Waste Bureau
Cogswell Building
Helena, MT 59620

RECEIVED
JUN 27 1989
Montana Department of Health
and Environmental Sciences
Solid and Hazardous Waste Bureau

Re: Big Timber Landfill

Dear Jim:

Please find enclosed a draft report of the preliminary hydrogeologic investigations for the proposed Big Timber landfill site. We would like to obtain your preliminary input as to the suitability of the site for meeting the applicable licensing requirements.

Once we have received your input we will make recommendations to the City as far as proceeding with installing a groundwater monitoring system, design and preparation of a formal license application. The City is most anxious to proceed on this project and correspondingly your timely review of the information would be greatly appreciated. Please do not hesitate to call me if you have any questions or need additional input.

Very truly yours,

DAMSCHEN & ASSOCIATES, INC.

Barry E. Damschen, P.E.

Enclosure

cc: City of Big Timber

DRAFT

HYDROGEOLOGIC INVESTIGATION REPORT
PROPOSED BIG TIMBER LANDFILL SITE
BIG TIMBER, MONTANA

RECEIVED

JUN 27 1989

Montana Department of Health
and Environmental Sciences
Solid and Hazardous Waste Bureau

Chen-Northern, Inc.

1610 B Street
P.O. Box 4699
Helena, Montana 59604
(406) 443-5210
FAX (406) 449-3729

Billings
Boise
Casper
Colorado Springs
Elko
Evanston
Glenwood Springs
Great Falls
Helena
Phoenix
Pocatello
Rock Springs
Salt Lake City
San Antonio
Tri-Cities
Yakima

DRAFT

HYDROGEOLOGIC INVESTIGATION REPORT
PROPOSED BIG TIMBER LANDFILL SITE
BIG TIMBER, MONTANA

Prepared for:

City of Big Timber

Big Timber, Montana

Prepared by:

Chen-Northern, Inc.
1610 "B" Street
P.O. Box 4699
Helena, Montana 59604

June 26, 1989

A member of the HIH group of companies

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1.0 INTRODUCTION

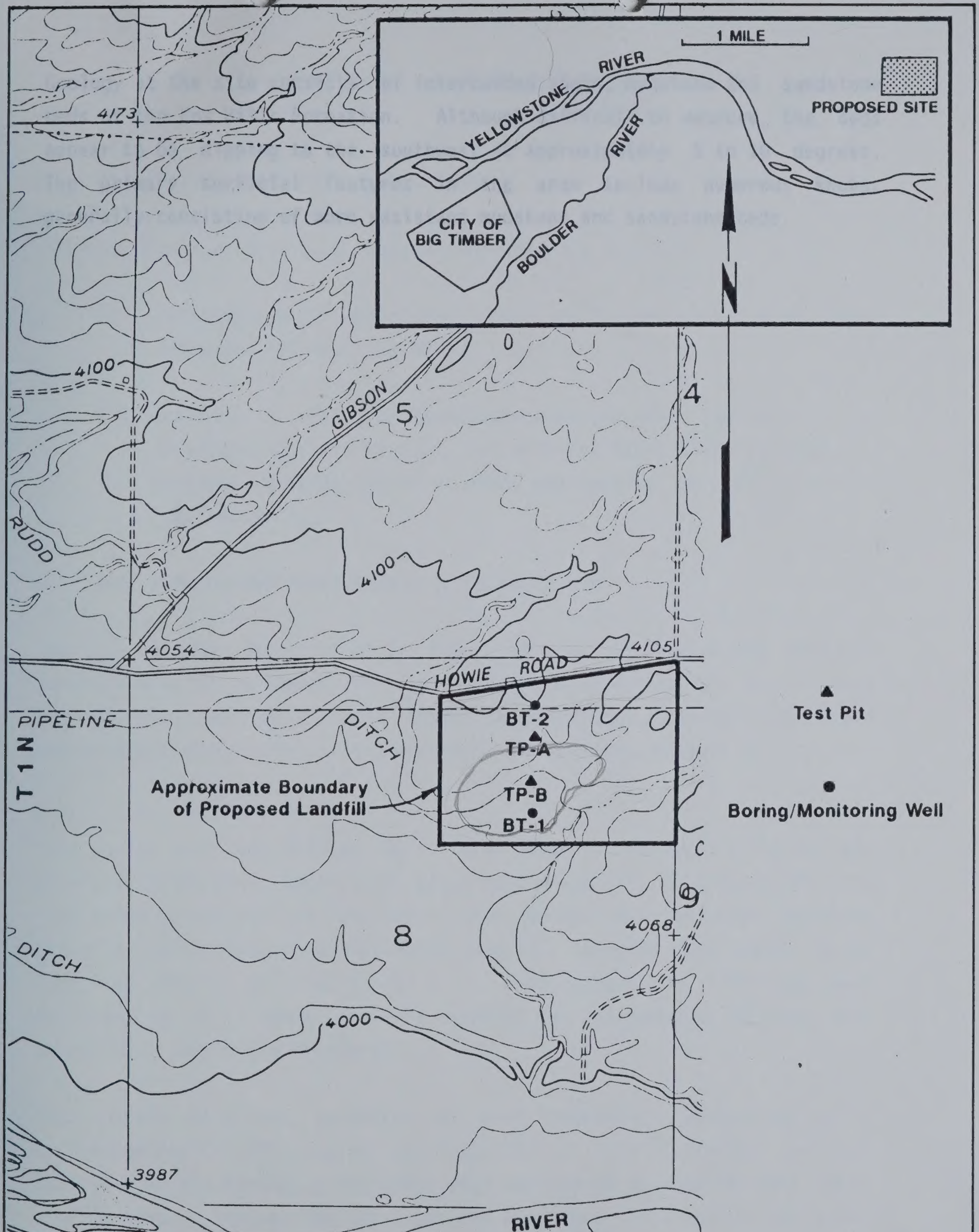
A preliminary hydrogeologic investigation was conducted at a proposed landfill site located approximately three miles northeast of the town of Big Timber, Montana to collect information on groundwater and subsurface lithologic conditions at the site. Such hydrogeologic information is necessary to address new landfill regulations (Subtitle D) proposed by the U.S. Environmental Protection Agency (EPA, 1988). During the site investigation, information on site geology and groundwater characteristics was collected. In addition, lithologic and groundwater data from water supply wells completed in the vicinity of the landfill were collected and reviewed.

Two borings were drilled at the proposed landfill site to obtain lithologic samples. One boring was completed as a dual completion monitoring well in the two different water bearing units encountered. Bailer recovery tests were performed on both the shallow and deep water bearing zones to provide an indication of the permeability of the monitored zones. Data resulting from these activities were used to evaluate the quantity and rate of groundwater movement beneath the proposed landfill site.

Two test pits were also excavated at the site; material samples collected from the pits were submitted to a soils laboratory for determination of permeability, grain size, and Atterberg limits.

1.1 SITE DESCRIPTION

The proposed Big Timber landfill site is located in the north half of Section 8, T1N, R15E, Montana (Figure 1). The landfill site is located on a gently sloping grass covered field, approximately one mile north of the Yellowstone River. The floodplain of the Yellowstone River is approximately one half mile south of the nearest portion of the proposed landfill site.


1 MILE
YELLOWSTONE RIVER
PROPOSED SITE
CITY OF BIG TIMBER
BOULDER RIVER
N
4173
4100
GIBSON
5
4
RUDD
4100
4054
HOWIE ROAD
4105
PIPELINE
DITCH
T 1 N
BT-2
TP-A
TP-B
BT-1
Approximate Boundary of Proposed Landfill
Test Pit
Boring/Monitoring Well
9
4068
8
DITCH
4000
3987
YELLOWSTONE RIVER
R 15 E
ER

Proposed Big Timber Landfill Site

FIGURE 1

Geology at the site consists of interbedded shale, mudstone and sandstone beds of the Fox Hills Formation. Although difficult to measure, the beds appear to be dipping to the southwest at approximately 5 to 10 degrees. The primary surficial features in the area include numerous knobs, generally consisting of more resistant mudstone and sandstone beds.

2.0 DATA COLLECTION ACTIVITIES

2.1 EXISTING HYDROGEOLOGIC INFORMATION

Existing hydrogeologic data reviewed for the site included:

1. Lithologic logs and static water level information from water wells drilled near the site.

2. Groff, S. L., 1962. Reconnaissance Ground-water Studies, Wheatland, Eastern Meagher, and Northern Sweet Grass Counties, Montana. Montana Bureau of Mines and Geology, Special Publication 24.

2.2 TEST BORINGS AND MONITORING WELL INSTALLATION

Two test borings (BT-1 and BT-2, Figure 1) were drilled at the proposed landfill site to document lithologic characteristics in the area. Test borings BT-1 and BT-2 were sited topographically downgradient and upgradient respectively, of the proposed landfill area (Figure 1).

Test boring BT-1 was drilled to a total depth of 80 feet using an air rotary drilling rig. Seven-inch steel casing was set to a depth of nine feet below ground surface and sealed with bentonite to maintain borehole integrity in the upper unconsolidated material. Samples were logged every five feet during drilling of BT-1 or when changes in lithology were observed. A split-spoon sample of material was attempted at 28 feet, but no material sample was recovered.

Test boring BT-1 was completed as dual completion monitoring well. Perforated 2-inch PVC casing was installed at two different vertical intervals in the boring; a bentonite seal was placed between the two water bearing zones. Test boring BT-2 was not completed as a monitoring well,

however the boring was left open and a steel well protector was installed to 9 feet below ground surface. Lithologic and well completion logs for test holes BT-1 and BT-2 are contained in Appendix A.

2.3 WATER LEVEL MEASUREMENTS

Water level in boring BT-1 was measured at 19.20 feet below the measuring point (top of steel casing) immediately following drilling and had risen to 18.75 feet below the measuring point by the following day. The water level in the well was 18.40 feet below the measuring point on June 1, 1989, approximately one week after the borehole had been drilled.

After the dual completion monitoring wells were installed in the borehole on June 1, 1989, both wells were purged of approximately 15 gallons of water. Water levels stabilized in the constructed wells after about 15 minutes at 18.5 feet in the shallow completion and 18.7 feet in the deep completion. These measurements indicate a slight downward hydraulic gradient is occurring at this well location.

The water level in test boring BT-2 was 46.62 feet below the measuring point immediately after drilling was completed and was 29.2 feet the following day. The water level had risen to 23.38 feet below the measuring point by June 1, 1989.

An elevation survey was completed at the site on May 23, 1989 in association with Mr. John Dribdahl. The datum used for the survey was the ground surface at boring BT-1. Results of this survey are:

Location	Elevation (relative feet)
Ground Surface, BT-1	0.0
Measuring Point, BT-1	+2.82
Ground Surface, BT-2	+22.89
Measuring Point, BT-2	+23.69

2.4 BAILER RECOVERY TESTS

Following installation of monitoring wells in test boring BT-1, a bailer recovery aquifer test was conducted on both well completions. The goal of this test was to gain an understanding of the permeability of the water bearing zones encountered beneath the proposed landfill site. After bailing approximately five gallons of water from each well, the rise of water in each well was measured with an electric well probe. Permeability calculations of acquired data were performed using the Bouwer and Rice method (Bouwer and Rice, 1976; Bouwer, 1989) and a method described in U. S Navy (1974).

2.5 TEST PITS AND SOIL SAMPLES

Two test pits (TP-A and TP-B) were excavated within the proposed landfill site boundaries to a depth of 13 feet. Material samples were collected at the bottom of each pit. Figure 1 shows the locations of the test pits. Grain size, Atterberg limits, and permeability tests were performed on the collected samples by Chen-Northern's soil testing laboratories in Billings and Helena.

3.0 DATA ANALYSIS

3.1 GROUNDWATER OCCURRENCE

Review of available geologic reports and well log data indicate that the principal groundwater-bearing units in the area are alluvium of the Yellowstone River and thin sandstone beds in the Fox Hills Formation. The Yellowstone River alluvium is a highly productive aquifer and yields good quality water (Groff, 1962).

Well logs indicate domestic wells located 0.5 to 1.5 miles northwest of the proposed landfill site range in depth from 46 to 140 feet and yield from 10 to 22 gallons per minute (gpm). Static water levels range from 16 to 40 feet below ground surface. Four domestic wells located 1.0 to 1.5 miles east of the proposed landfill site range from 65 to 233 feet deep and yield from 0 to 40 gpm.

Artesian groundwater was encountered in at least two water-bearing zones beneath the proposed landfill site. These units are confined above and below by clay/shale aquitards. The upper water-bearing zone was encountered at a depth of 27 to 38 feet in BT-1 and is comprised of interbedded sandstone and shale beds. The lower water-bearing zone in BT-1 was encountered from 60 to 66 feet and is predominantly sandstone with some minor shale. The water-bearing zone encountered in boring BT-2 was not as distinct as these identified in BT-1. A brown mudstone unit encountered at depth of 42 feet in boring BT-2 is the likely source of artesian water encountered.

3.2 GROUNDWATER MOVEMENT

Groundwater movement in an aquifer can be characterized by determining groundwater gradients, aquifer permeabilities, and groundwater velocities. Because of the irregular topography and wide spacing of wells in the area

surrounding the landfill, precise determination of a regional groundwater gradient and flow direction was not possible. However, a gradient was calculated from boring BT-2 to monitoring well BT-1 by using static water level data obtained from the wells in conjunction with elevation survey data.

Using the survey data and static water levels in the two wells, the hydraulic gradient from BT-2 to BT-1 is 0.015 ft/ft. The magnitude of this gradient probably approximates the regional gradient in the vicinity of the landfill site. Based on the configuration of the site topography, the direction of groundwater movement in the area is probably to the south, although insufficient data are available to confirm this observation. Additional wells in the immediate vicinity of the landfill would be necessary to determine the precise direction of groundwater flow beneath the landfill.

Permeability of the water-bearing sandstone beds encountered in test boring BT-01 was calculated using data from the bailer recovery test. Two methods were used to calculate permeability including: 1) the U.S. Navy method (1974) and (2) the Bouwer and Rice method (1976). These methods yielded calculated permeabilities ranging from 1.1×10^{-4} to 3.0×10^{-4} cm/sec.

The average linear velocity for groundwater at the proposed landfill site was calculated using the above permeabilities in conjunction with the equation:

$$v = \frac{K\,i}{n}$$

where: v = velocity (cm/sec)
K = permeability (cm/sec)
i = gradient
n = porosity

The porosity of the aquifers at the site was assumed to be 15 percent. Groundwater velocities calculated from these inputs to equation ranged from 1 cm/day to 2.5 cm/day. An average of these two values, or approximately 1.7 cm/day, may be representative of the average linear velocity of groundwater at the site.

These calculated permeabilities and velocities indicate that the subsurface materials underlying the potential landfill site are not conducive to hosting significant groundwater movement.

3.3 LABORATORY TESTS OF BASE MATERIAL

Laboratory tests of the material collected from test pits at the proposed landfill site are considered representative of the type of base material which will underlie the landfill. The material is classified in accordance with ASTM D2487, as a low plastic lean clay (CL). Grainsize analysis of the material indicates that the material is approximately 30 percent clay, 62 percent silt, and 8 percent sand. The liquid limit was 31 and a plastic index of 16. Permeability testing was performed on a remolded sample from Test Pit A at 95% maximum density, as determined by ASTM D698. Permeability of the remolded material is 3×10^{-7} cm/sec. Atterberg limit, grain-size, and permeability testing data sheets are contained in Appendix B.

Laboratory permeability tests indicate that this material exhibits a low permeability. The laboratory permeability test was performed on a remolded sample of the base material; the permeability measured for the sample may be somewhat lower than the actual field permeability. However, the plastic limit of the sample indicated that any cracks or openings which may develop in the soil profile during desiccation of the soil would likely close upon re-wetting of the soil.

4.0 CONCLUSIONS AND RECOMMENDATIONS

A preliminary hydrogeologic investigation of the potential Big Timber landfill site was performed. Tasks completed included: a review of available geologic and hydrogeologic information for the site; installation of one dual completed monitoring well; drilling of a second test boring; and excavation of two test pits. The monitoring well installed during this investigation is likely located downgradient or possibly cross-gradient (with respect to the groundwater flow direction) of the landfill site. Subsurface material encountered in the monitoring well boring was clay and silt, mudstone, and sandstone beds. The sandstone beds exhibited relatively low hydraulic conductivities ranging from 1.1 to 3 cm/sec.

A complete characterization of groundwater beneath the landfill site will require several additional wells to better define the groundwater flow direction and aquifer permeabilities. These wells may also serve as monitoring points for groundwater quality sampling. To better determine the direction of groundwater flow at the landfill, a minimum of three additional wells are recommended around the landfill. One monitoring well should be located on the north edge of the site and two others should be located southeast and southwest of the landfill. Also, additional in situ permeability tests should be performed on the base material from 13 to 25 feet beneath the site.

Laboratory tests on material collected at the base of the proposed landfill site indicate that the base material has a high clay and silt content and exhibits a relatively low permeability. The material also appears to be conducive to compaction which will further reduce its permeability. The general suitability of this material as a base material is further supported by drilling completed at the site which indicated the material serves as an aquitard. A pressure head of approximately 11 feet of water in the aquifer encountered at 27 feet below the landfill was identified during drilling activities.

Proposed U. S. EPA regulations (EPA, 1988) have identified six types of locations that require special siting restrictions. These restrictions pertain to the proximity of the landfill to: 1) airports; 2) 100-year floodplain; 3) wetlands; 4) fault areas; 5) seismic impact zones; and 6) unstable areas. The proposed Big Timber landfill site likely meets all of the criteria relating to these restrictions, although further evaluation of the siting restrictions relative to the proposed landfill site is necessary to confirm this premise.

This preliminary hydrologic evaluation of the proposed Big Timber landfill site indicates that the hydrogeologic conditions at the site are relatively well suited for construction of a properly designed municipal solid waste facility. Further investigative activities may be required to support a landfill permit application in consideration of proposed Subtitle D rules.

Prepared by:

David Hazen, P.G.
Hydrologist

Reviewed by:

Myles J. Grotbo
Myles Grotbo
Senior Hydrologist

Jeremiah B. Bowser
Jeremiah B. Bowser, P.E.
Division Manager

6.0 REFERENCES CITED

Bouwer, H., 1989. The Bouwer and Rice Slug Test - an Update. Groundwater, Vol. 27, No. 3, pp. 304-309.

Bouwer, H. and R. C. Rice, 1976. Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers with Completely or Partially Penetrating Wells. Water Resources Research. Vol. 13. June, 1976, pp. 424-428.

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APPENDIX A

LITHOLOGIC AND WELL COMPLETION LOGS OF BORE HOLES BT-1 AND BT-2

Chen-Northern, Inc.

WELL COMPLETION LOG

State: Montana County: Sweetgrass Project: Big Timber Landfill Hole Name or Number: BT-1 shallow & deep

Legal Location: T 1N R 15E Sec 8 Tract ABDD Descriptive Location: 400' west of draw, downgradient of proposed L.F.

Recorded By: D. Hazen Hole Started: Time: 1045 Date: 05/23/89 Hole Completed: Time: 1545 Date: 05/23/89 Driller: Rock Creek Drilling, Bill Kupfner

Drill Method: Rotary Drilling Fluids Used: Air Pilot Hole Diameter: 8" to 9' Drilled Hole Diameter: 6"

Total Depth Drilled: 80' Total Depth Reamed: N/A Total Depth Cased Below G.S.: 71.5' Diameter and Type of Casing: 2" PVC

Weight or Gage of Casing: Sch 40 Interval Perforated or Screened Below G.S.: 35.5-25.5 68.5-58.5 Target Aquifer: Fox Hills Formation Packer Type and Depth Below G.S.: N/A

DURING INSTALLATION WAS:	YES	NO
Well Developed?	x	
Well Test Pumped?		x
Water Samples Taken?		x
Material Samples Taken?	x	
E-Logs?		x

Method Perforated or Screened

- ___ No casing in hole
- ___ Open bottom
- ___ Slotted with Mill's Knife
- ___ Slotted with a torch
- ___ Screened by pulling casing
- ___ Field saw cut
- x Mechanical slots 0.030 (size)
- ___ Other (specify) ___

Static Fluid Level Below Measuring Point:	Date/Time Measured:
18.40	06/01/89 @ 0850
18.75	05/24/89 @ 0839
19.27'	05/23/89 @ 1734

Measuring Point Description/Elevation: Top of steel well protector, +2.82 ft. MP Height Above (+/-) or Below G.S.: +2.82'

Well Annulus Completion Description: Dual Completion: 80'-72', cuttings; 72-71.5', Wyo-Ben bentonite; 71.5'-56.6', 10-20 Colorado Silica Sand; 56.5'-38', Wyo-Ben Bentonite (medium); 38'-72', 10-20 Colorado Silica Sand; 22'-11', Wyo-Ben Bentonite (medium)

Well Development Description: Bailed 15 gallons from both the shallow and deep wells; performed bailer Recovery Test on each well.

Remarks: 7" steel surface casing installed to 9 ft. below ground surface. Volclay bentonite pellets placed from 9' to 8' BGS outside of 7" steel and 8' to 1' backfilled with clay/shale cuttings, concrete surface seal installed around steel surface casing. Ground surface at BT-1 assumed elevation of 0.0 ft.

Chen-Northern, Inc.

DRILLING AND LITHOLOGIC LOG

BT-1

(Depth Below G.S.)

From	To	DRILLING LOG Geological, Drilling, and Water Conditions and Sampling
0	1′	Topsoil/organic material
1′	27′	Gray clay/shale, friable, minor silt and sand, dry minor organics
27′	28′	Silty sandstone, minor water <0.5 gpm, dark red. No recovery with split spoon sampler.
28′	38′	Sandstone and shale interbedded - dark red - making approximately 2 gallons per minute
38′	60′	Gray shale, dry - sealing off water in upper zone (27 to 38′)
60′	66′	Red sandstone with some shale - making 5-6 gpm
66′	74′	Gray shale
74′	80′	Shale with some red sand interbeds, still making 5-6 gpm

TD = 80′

Chen-Northern, Inc.

WELL COMPLETION LOG

State: Montana County: Sweetgrass Project: Big Timber Landfill Hole Name or Number: BT-2

Legal Location: T 1N R 15E Sec 8 Tract ABAA Descriptive Location: 100′ west of TP-10, 100′ NE of TP-1, upgradient

Recorded By: D. Hazen Hole Started: Time: 1600 Date: 05/23/89 Hole Completed: Time: 1710 Date: 05/23/89 Driller: Rock Creek, Kupfner

Drill Method: Rotary Drilling Fluids Used: Air Pilot Hole Diameter: 8" to 9′ Drilled Hole Diameter: 6"

Total Depth Drilled: 47.2′ Total Depth Reamed: N/A Total Depth Cased Below G.S.: N/A Diameter and Type of Casing: N/A

Weight or Gage of Casing: N/A Interval Perforated or Screened Below G.S.: N/A Target Aquifer: N/A Packer Type and Depth Below G.S.: N/A

DURING INSTALLATION WAS:	YES	NO
Well Developed?		x
Well Test Pumped?		x
Water Samples Taken?		x
Material Samples Taken?	x	
E-Logs?		x

Method Perforated or Screened

X	No casing in hole
	Open bottom
	Slotted with Mill's Knife
	Slotted with a torch
	Screened by pulling casing
	Field saw cut
x	Mechanical slots 0.030 (size)
	Other (specify)

Static Fluid Level Below Measuring Point:	Date/Time Measured:
23.38	06/01/89 @ 1330
29.20	05/24/89 @ 0830
46.62	05/23/89 @ 1713

Measuring Point Description/Elevation: Top of steel well protector, 23.69 ft. MP Height Above (+/-) or Below G.S.: +0.8′

Well Annulus Completion Description: Well left open, not completed as monitoring well

Well Development Description: none

Remarks: 7" steel surface casing installed to 9′ BGS; Measuring Point Elevation Determined by level survey; Datum (0.0′) is ground surface at well BT-1

Chen-Northern, Inc.

DRILLING AND LITHOLOGIC LOG

BT-2

(Depth Below G.S.)

From	To	DRILLING LOG Geological, Drilling, and Water Conditions and Sampling
0	15′	Overburden, gray silt with clay, ocassional boulder, slightly moist
15′	21′	Brown to light brown shale, friable, dry
21′	25′	Brown shale, friable, dry
25′	40′	Light gray to brown mudstone, dry
40′	42′	Light purple to gray, clay/shale, slightly moist
42′	47.2	Light gray to brown mudstone, slightly moist

APPENDIX B

LABORATORY TEST RESULTS

Chen-Northern, Inc.

A member of the HIH group of companies

600 SOUTH 25TH STREET
P. O. BOX 30615
BILLINGS, MT 59107
(406) 248-9161
FAX (406) 248-9282

TECHNICAL REPORT

AMERICAN COUNCIL OF INDEPENDENT LABORATORIES, INC.

REPORT TO:

CHEN-NORTHERN, INC.
ATTN: MR. DAVE HAZEN
P O BOX 4699
HELENA, MT 59601

DATE: June 20, 1989
JOB NUMBER: 87-598
SHEET: 1 OF 4
INVOICE NO.: 78891

REPORT OF: Laboratory Testing - Big Timber (189-3019)

Sample Identification:

On June 6, 1989, we received two soil samples from the subject project. Your instructions were to perform sieve and hydrometer analysis, moisture content determinations, moisture-density relationship and a remolded triaxial permeability test.

The triaxial permeability test specimens were remolded to 95 percent of the maximum dry density and optimum moisture content determined from the moisture-density determination. The tests were performed in general accordance with ASTM or other approved procedures. The test procedures are summarized below.

Test	Standard
Particle Size Analysis	ASTM D422
Moisture Content	ASTM D2216
Moisture-Density Determination	ASTM D698
Triaxial Permeability	Corps of Engineers Manual EM 110-2-1906 Appendix VII

The test results are included on the attached plates. If you have any questions regarding this report or if we can be of further service, please contact us.

Reviewed by

kg

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Chen-Northern, Inc.

GRAIN SIZE DISTRIBUTION CURVE

Project: Big Timber

Location: TP-A

Classification

Moisture Content 11 %

Sample No.

Job No. 87-598

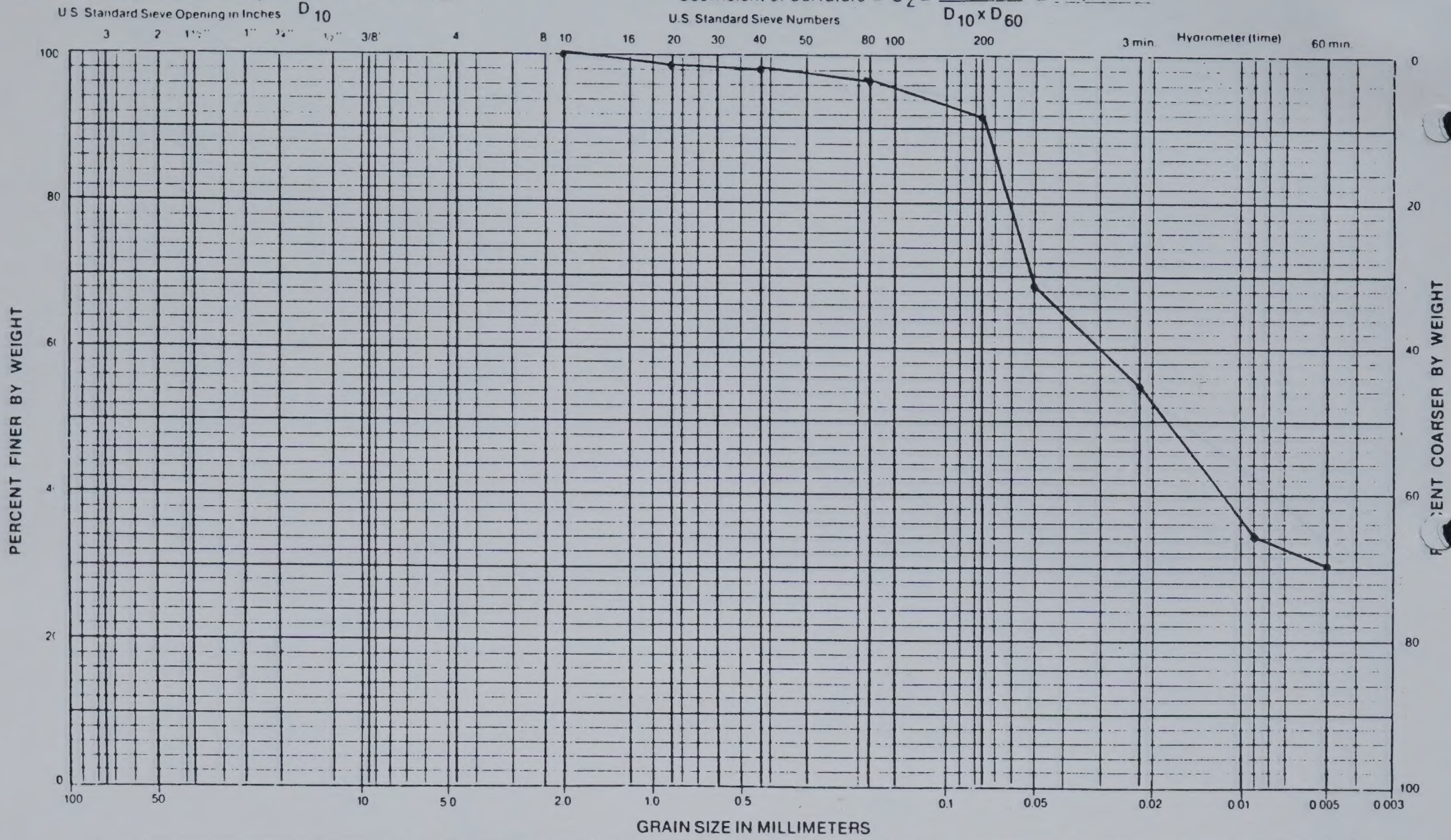
Date June 20, 1989

Liquid Limit - %

Plasticity Index - %

Coefficient of Uniformity = $C_U = \frac{D_{60}}{D_{10}}$ = N/A

Coefficient of Curvature = $C_Z = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ = N/A



<table>
<tr><th colspan="2">Gravel</th><th colspan="3">Sand</th><th colspan="2">Fines</th></tr>
<tr><td>Coarse</td><td>Fine</td><td>Coarse</td><td>Medium</td><td>Fine</td><td>Silt</td><td>Clay</td></tr>
</table>

(Rev. 1/89) CNI-105

Chen-Northern, Inc.

GRAIN SIZE DISTRIBUTION CURVE

Project: Big Timber

Location: TP-B

Classification

Moisture Content 12 %

Sample No.

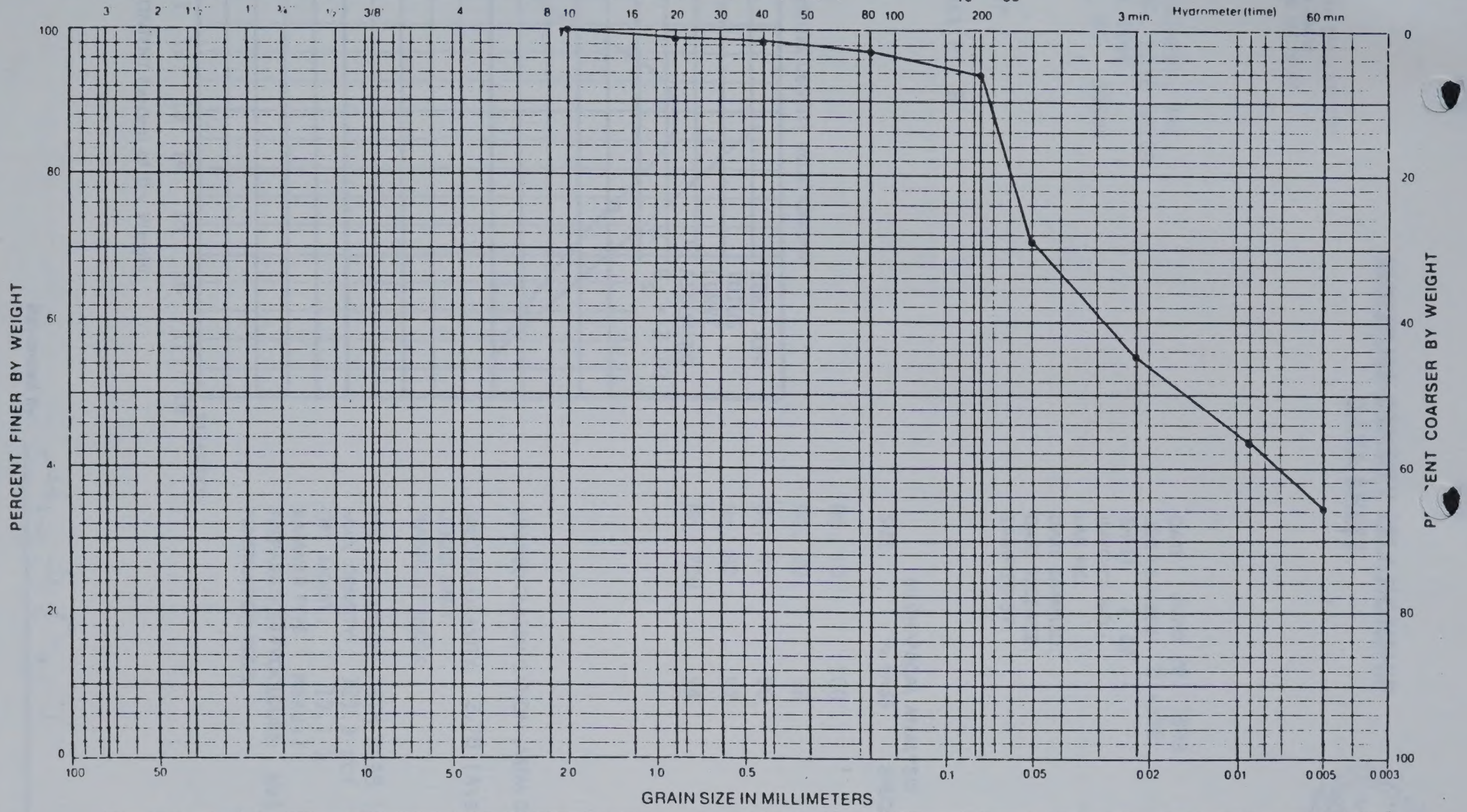
Job No. 87-598

Date June 20, 1989

COEFFICIENT OF PERMEABILITY 3 x 10^{-7} cm/sec

Coefficient of Uniformity $= C_U = \frac{D_{60}}{D_{10}} =$ N/A

Coefficient of Curvature $= C_Z = \frac{(D_{30})^2}{D_{10} \times D_{60}} =$ N/A



Gravel		Sand			Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay

(Rev. 1/89) CNI-105

Northern
Engineering and Testing, Inc
600 SOUTH 25TH STREET
P. O. BOX 30615
BILLINGS, MT 59107

MOISTURE-DENSITY RELATIONSHIP DATA SHEET

AMERICAN COUNCIL OF INDEPENDENT LABORATORIES, INC.
ACIL

REPORT TO: CHEN-NORTHERN, INC.
ATTN: MR. DAVE HAZEN
P O BOX 4699
HELENA, MT 59604

DATE: June 20, 1989
JOB NUMBER: 87-598
SHEET: 1 OF 1
INVOICE NO.:
LAB NO.:
DATE SAMPLED:
DATE RECEIVED:
SAMPLED BY:

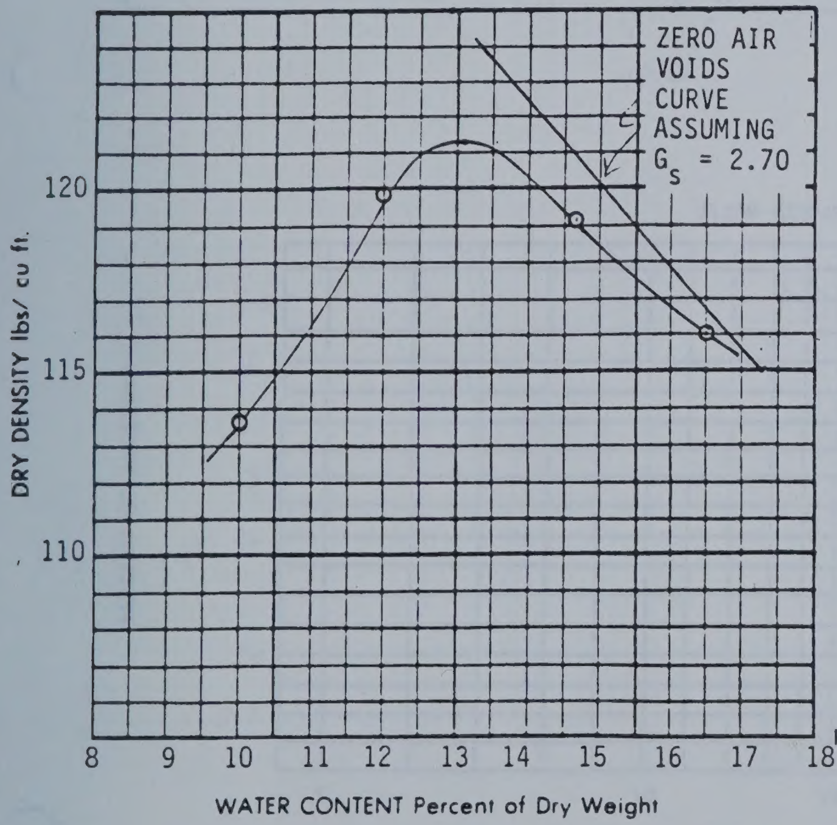
PROJECT: Big Timber
CONTRACTOR:
SAMPLE LOCATION: Test Pit B

MATERIAL USE:

MECHANICAL ANALYSIS

SIZE	% PASS	SPECS.
No. 10	100	
No. 20	99	
No. 40	98	
No. 80	97	
No. 200	94	

MOISTURE-DENSITY RELATIONSHIP



UNIFIED CLASSIFICATION (ASTM D2487)

SPECIFIC GRAVITY: 2.70 (Assumed)
LIQUID LIMIT:
PLASTICITY INDEX:

TEST PROCEDURE ASTM D698 'A'
MAX. DENSITY: 121.3 pcf
OPT. MOIST.: 13.1 %
RAMMER TYPE: Manual
PREPARATION PROCEDURE: Wet
PENETRATION RESIS.:

REMARKS:

DISTRIBUTION:

Reviewed By:

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Northern

Engineering
and Testing, Inc.

SOIL MOISTURE CONSTANTS DETERMINATION

Project: Big Timber Test Pit
Job No. 91-3020
Feature
Date Sampled
Sampled By D. Hazen

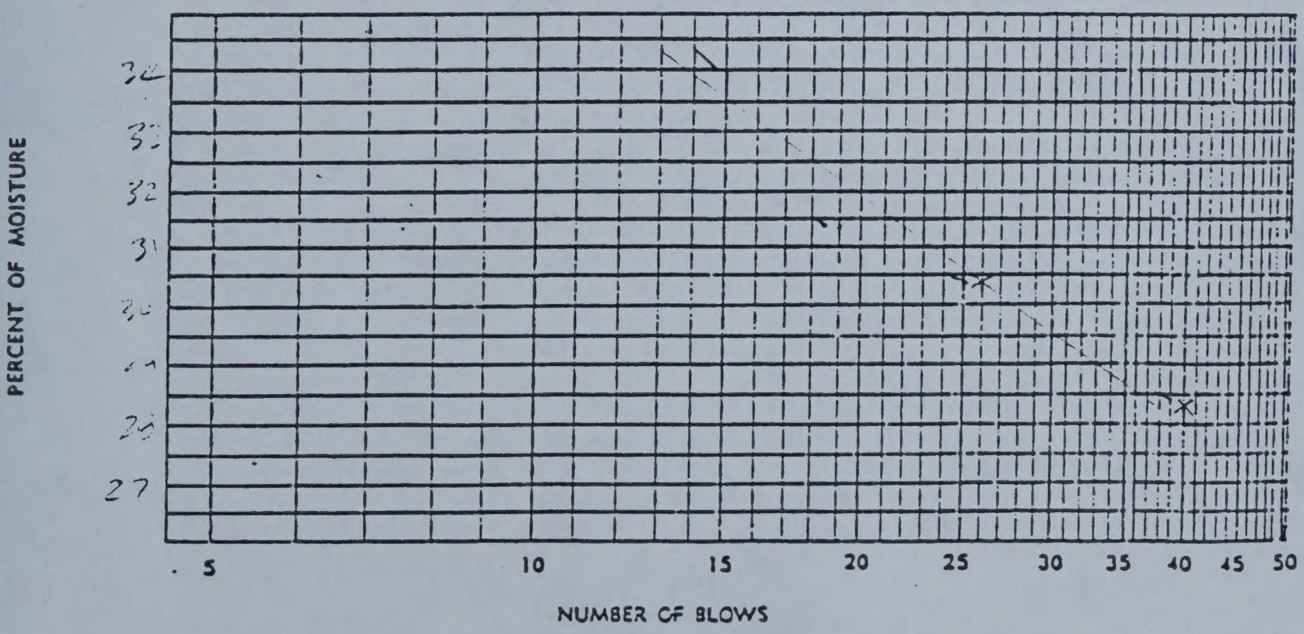
Sample Number 317[illegible]
Excavation No.
Depth
Tested By SC Computed By
Checked By JB

Liquid Limit — Plastic Limit — Field Moisture Equivalent

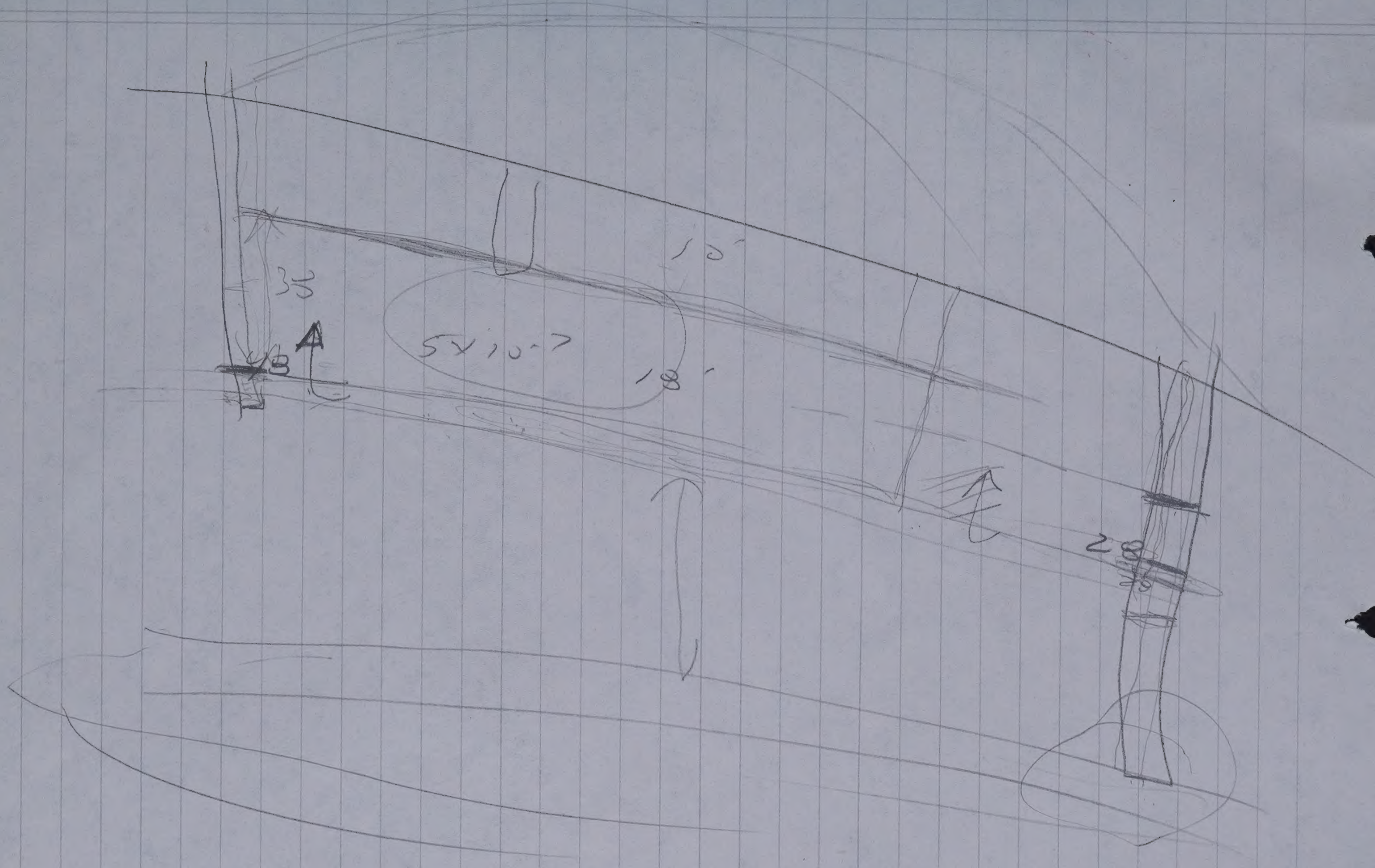
		Plastic Limit		Liquid Limit				
	Trial No.	1	2	1	2	3	4	5
	Can No.	K	RR	[illegible]	~~26~~ [illegible]	[illegible]	8	
	No. of Blows			40	26	19	15	
1	Wt. Can + Wet Soil	24.[illegible]	26.30	[illegible]	[illegible]	[illegible]	14.[illegible]	
2	Wt. Can + Dry Soil	[illegible].19	2[illegible].31	[illegible]	[illegible]	15.[illegible]	[illegible]	
3	Wt. of Water (1-2)	2.4[illegible]	2.61					
4	Wt. of Can	5.21	5.32	10.67	[illegible]58	[illegible]	10.65	
5	Wt. of Dry Soil (2-4)		[illegible]					
6	% Moisture (3/5 x 100)	[illegible]	14.5		[illegible]	[illegible]		

14.6

FLOW CURVE



Liquid Limit L.	31	Plastic Limit P.	15	Plasticity Index I = L - P	16


A
5x10-7

Sweetgrass

RECEIVED
FEB 21 1989
MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID & HAZARDOUS WASTE BUREAU

United States Department of Agriculture
Soil Conservation Service
Federal Building, Room 443
10 East Babcock Street
Bozeman, MT 59715

Subject: ENG--Proposed Stenberg Sanitary Landfill Inventory and Evaluation, Big Timber
S2,SE4,SE4,Sec 30,T2N,R15E

Date: November 18, 1987

To: Gordon J. Hill
District Conservationist
Soil Conservation Service
Big Timber, MT.

A sanitary landfill site investigation and evaluation was made on September 28, 1987. Assisting were Lyle Stenberg, Landowner, Fred Schmidt, MBMG Drill Operator, and Mick Sweeney, Engineer and Dan Glasgow, Technician of the SCS.

Summary

The site is suitable for use as a Class II landfill if irrigation of the site and conveyance of irrigation water above the site is stopped. The pollution potential to ground and surface waters is low if proper diversions, final grading, and reclamation procedures are used. The site is not recommended for the disposal of Class I wastes. The need to construct all-weather access and marginal excavation depths are the major limitations of the site.

General

Water passing through buried refuse leaches out contaminants. This "leachate" may drastically alter the quality of surface and ground waters. Sanitary landfill siting and operations should minimize the amount of water that can reach the refuse and should provide for the control or attenuation of any leachate produced.

Site Evaluation

Geology/Soils: The site is an irrigated pasture on the east flank of the Otter Creek drainage (see Attachment 1). The pasture consists of two fields separated by a main irrigation ditch and bounded on the northerly and southerly sides by drainageways incised approximately 10 feet into the flank. The flank is composed of interbedded shales and sandstones of the Hell Creek Formation and slopes 2 to 3 percent to the west-southwest. Dip of the bedrock is toward the north-northeast at less than 1 percent. At the easterly end of the upper field there is a 12 foot layer of fractured sandstone overlying shale. Borings indicate that this layer is truncated near the east boundary by the slope yielding 18 feet of colluvial silty clays and silty sands, and weathered shale over compact shale. The layer of fractured sandstone is also likely to be under and extending north of the ridge in the upper field. Near the west end of the upper field there is 15 feet of silty clay colluvium and weathered shale over compact shale with a 6 inch layer of fractured sandstone at 10 feet (see Attachment 2). No borings were made in the lower field as outlined in Attachment 1. The depth to compact shale or fractured sandstone is expected to

progressively decrease in a downslope direction. Surface soils are siltly loams to siltly clays.

Ground/Surface Water: The permanent ground water is estimated to be 80 to 100 feet deep. There are no known wells for several miles that tap the Hell Creek sandstones. Upslope runoff will be diverted to side drainages by the existing upper irrigation ditch along the east section line. Presently the upper field is flood irrigated by this ditch and a downslope ditch atop the ridge. The lower field is irrigated from the main ditch and contour ditches fed by the downslope ditch atop the ridge. The side drainages immediately enter the Meyers-Rapstad-Rudd ditch which ultimately may discharge to the Yellowstone River alluvium 5.5 miles downstream of the site. The average annual precipitation is approximately 12 inches.

Operational Considerations: Access from Big Timber is via 2.7 miles of paved highway, 0.8 miles of gravelled county road and 1.3 miles of unsurfaced road to a Otter Creek crossing. The unsurfaced road will need to be regraded, widened, builtup, and gravelled in several reaches to support frequent heavy truck traffic. From the creek crossing, 1/8 mile of new road across the floodplain, a canal crossing, and 1/2 mile new road on the west and south edge of the lower field is needed to reach the upper field. The site is exposed to winds. Litter control fences with careful planning and operation will be needed.

Conclusions

--Upslope surface runoff will be diverted by an existing ditch. Runoff within the site during operations will be inexpensive to control.

--Irrigation upslope of the landfill will have to be discontinued. Water conveyed downslope on the north side of the landfill should be in lined ditches or pipe.

--The silty clays and sands when mixed during excavation will be suitable cover materials to limit infiltration. The soils will be sticky and slick when wet.

--Maximum trench depths will be limited to 15 feet due to compact shales or sandstones. Effective depths will decrease in a downslope direction in the lower field. The northern portions of the two fields will likely have sandstones at a relatively shallow depth as shown in Attachment 1. Thin fractured layers of sandstone may be encountered elsewhere but will not hinder landfilling.

--Any leachate produced will migrate to the west or north. Leachate will perch atop the compact shale erosional surface and migrate downslope in a west-southwest direction, ultimately seeping into the canal at the toe of the flank or entering the alluvium of Otter Creek. This leachate flow could reasonably be intercepted and controlled if ever necessary. Leachate migrating westward that contacts fractured sandstones will infiltrate the Hell Creek and migrate north-northeast. There are no wells in this direction that tap the sandstones nor are any expected to as drilling depths become uneconomical within several miles.

--Serving a population of 2000 and with a planned operation, 10 acres of the upper field should last 25 to 30 years.

Recommendations

--The upper ditch should be terminated at the northside drainageway. If the lower field is landfilled and the downslope ditch from the main ditch is used, it should lined or replaced by pipe. The main ditch should then terminate at the downslope ditch with a wasteway to the north side drainageway.

--Landfilling should not approach closer than 20 feet to the slope break of the side drainageways.

--An operation plan should be developed prior to landfilling to insure leachate is minimized and that final slopes and drainage will resist erosion of the cover material.

--At least two feet of topsoil should be saved for final reclamation.

--The site should be reclaimed to grazing land as landfilling procedes. Landfilled areas should not be irrigated. Contact the SCS Field Office for seeding recommendations.

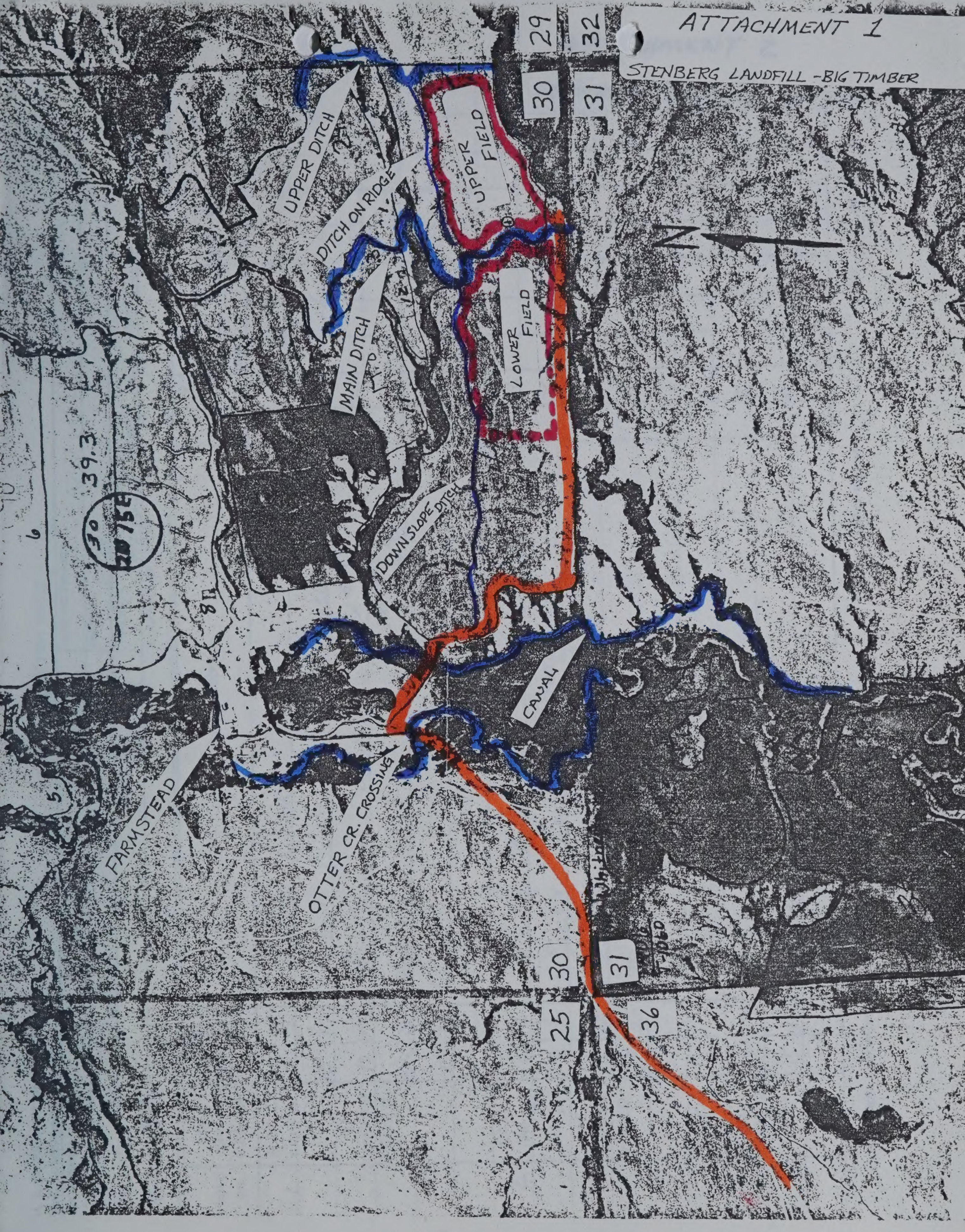
David J Jones
DAVID J. JONES
Environmental Engineer
Field Support Staff

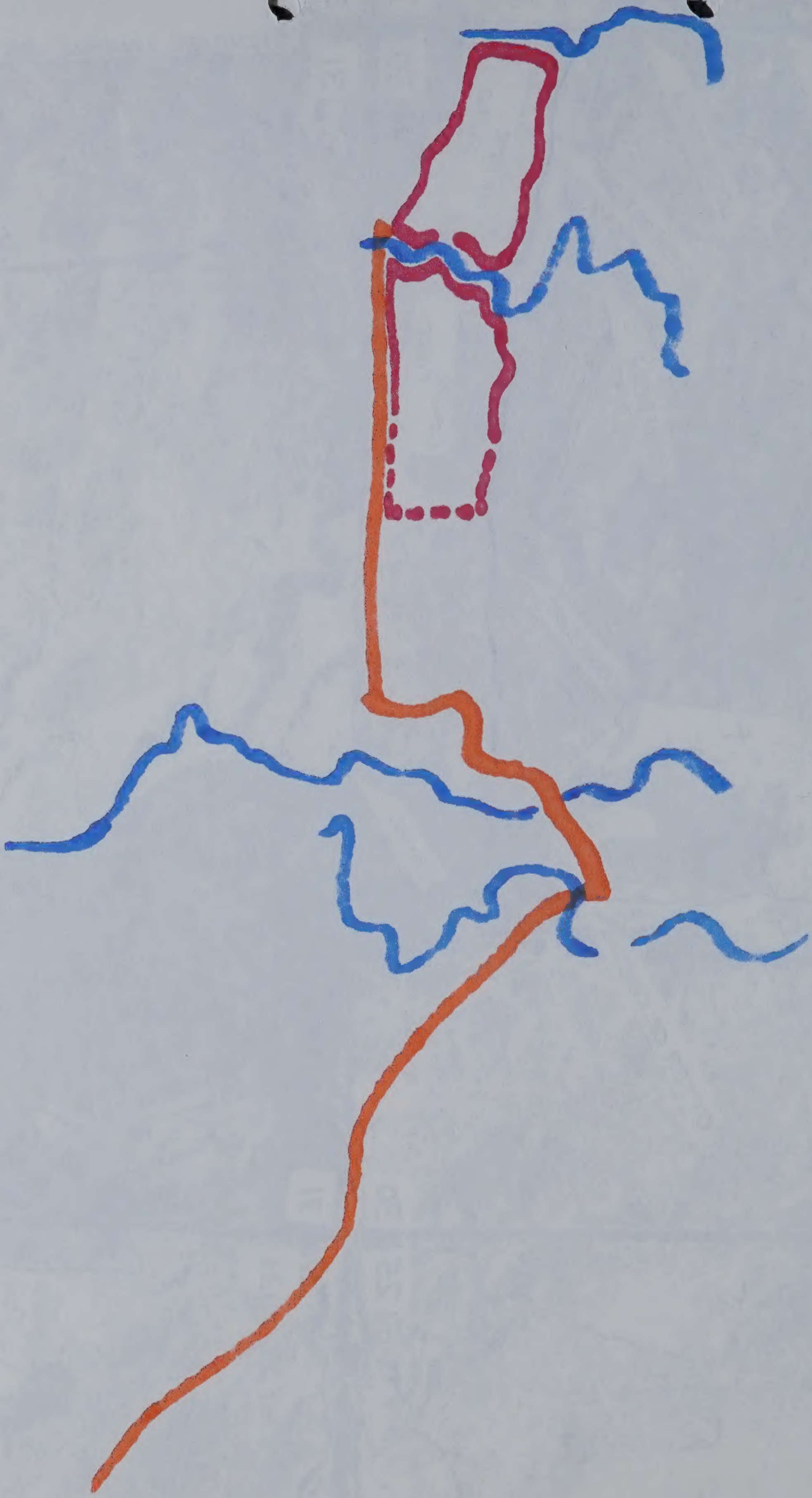
Attachments

cc:
Don McAndrew, AC, SCS, Bozeman
Richard W. Van Klaveren, SCE, SCS, Bozeman

ATTACHMENT 1

STENBERG LANDFILL - BIG TIMBER


29
32
30
31
UPPER DITCH
DITCH ON RIDGE
UPPER FIELD
LOWER FIELD
MAIN DITCH
DOWN SLOPE DITCH
CANAL
FARMSTEAD
OTTER CR. CROSSING
39.3
6
30
2N 15E
5
30
31
25
36



U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

LOG OF TEST HOLES

SCS-533
REV. 3-67

WATERSHED: YELLOWSTONE

SUB-WATERSHED: OTTER CREEK

SITE NO.

LOCATION: LYLE STENBERG

OWNER: LYLE

STATE

LOGGED BY: M.S.

DATE: 9-28-87

PROJECT: WP-07 ______ WP-08 ______ FP-03 ______ P.L.-46 ______

DRILLING EQUIPMENT: B-50

LOCATION OF HOLES

HOLE NO.	STA. & SURFACE ELEVATION	HOLE DEPTH FROM FT.	HOLE DEPTH TO FT.	DESCRIPTION OF MATERIALS	N	USCS	TYPE BIT USED	SAMPLES NO.	TYPE [1]	FROM FT.	TO FT.	CSE. %	REM. [2] MIN. DIAM.	REC. [3] %
1	NEAR LOWER END OF UPPER FIELD	0	5	SILTY LOAM		CL								
		5	10	SILTY CLAY CASED		CL								
		10	10½	thin Layer of Sandstone SCH 40 PVC		SC								
		10½	15	Fractured shale. SAW SLOTS 10' → 18'±		Kw								
		15	18	Bedrock Kw		Kw								
2	NEAR UPPER END OF UPPER FIELD	0	3	SILTY CLAY		CL								
		3	6	SILTY SAND COMPOSITE SAMPLE		SC								
		6	18	Silty Sandy clay		CL								
		18	20	HARD Kw		Kw								
3	UPPER END OF UPPER FIELD	0	3	SILTY SAND		SC								
		3	15	SANDSTONE, FRACTURED		Kw								
		15	18	SHALE, WEATHERED		Kw								

1. DISTURBED-UNDISTURBED-ROCK CORE 2. COARSE MATERIAL REMOVED 3. PERCENT SAMPLE RECOVERY

SHEET ____ OF ____ SHEET

SCS ATTACHMENT 2

STENBERG LANDFILL - BIG TIMBER

June 24, 1990

City of Big Timber
c/o James Devennsy, Mayor
City Hall
Big Timber, MT 59011

Regarding: Class II Landfill Application, City of Big Timber, Montana

Dear Mayor Devennsy:

Pursuant to Section 75-10-221 MCA, and ARM 16-14-511, the Department of Health and Environmental Sciences, Solid and Hazardous Bureau, hereby notifies you that your application for Class II, Sanitary Landfill, filed with the Department on March 15, 1990, is incomplete.

The Montana Solid Waste Management Act (SWMA) provides specific criteria by which an application for sanitary landfill is to be provided. In general terms, the Department must be able to determine whether or not the proposed sanitary landfill can and will be operated in compliance with the SWMA and rules promulgated thereunder. In order to make this determination the following additional information is required:

1) Question 19 on the application states that no special or unusual waste will be accepted. Does the landfill facility intend to accept asbestos? If so, what precautions are planned to handle this material?

2) The insurance policy submitted with the application specifically excludes liability arising out of claims "at or from any site or location used by or for the entity or others for the handling, storage, disposed processing, or treatment of waste." Do you intend to obtain insurance coverage for this activity?

3) Question 18 on the application indicates that open burning will be conducted at the landfill facility. The plans do not indicate a specific site for this activity. Is additional information available in this regard?

4) A gas line is known to transect the northern portion of the proposed landfill site. Precautions must be taken to ensure that traffic loads on the access road do not affect the structural integrity of the pipe.

5) Depth to groundwater in the area to be trenched has not been established. The lack of borings in the area to be trenched combined with the admitted difficulty in correlating water bearing zones leads one to conclude that regulatory criteria for waste to water separation has not been met. The absence of correlated zones due to their variable nature raises serious questions about the extent and integrity of the stratigraphic units being used to characterize the site as to permeabilities and water levels. A double-ring infiltrometer can be of limited assistance in characterizing the vertical permeability of a site with very complex lithology. In addition to the limitations of observed groundwater data, 'seasonal high' water levels have not been addressed. Federal regulations pertaining to Class II landfill sites require a 15 foot (consistent with state regulations of 10-20 feet) separation of the landfill trench bottom and the 'seasonal high' water level. The shallow water table near BT-3, the sequence of dry years and variability of the water bearing zones causes us great concern regarding high seasonal or intermittent water levels at the site.

6) The application states that subsurface materials are, "not conducive to significant groundwater movement." We have difficulty in agreeing with this statement given that both quantity and velocity comprise significant, and the complexity of the subsurface is not well documented. Further, it is difficult to extrapolate parameters across the area where it is admitted that water bearing zones cannot be correlated.

7) The proposed federal regulations require that groundwater monitoring systems be installed so the leachate problems can be detected and abated. Proposing to initiate an abatement action "after leachate is generated" without an adequate detection system, is not consistent with the rules. The sloped trench design is not an adequate detection system, in itself, since it does not address all leachate transport routes.

8) As a result of comments 5, 6, and 7 we propose the following recommendations:

   a) Additional borings are needed in the trench locations to identify lithology and establish permeabilities for the entire site. The additional borings could be wells where leachate monitoring is appropriate and could serve to provide additional water table information.

   b) Surface water control systems and leachate detection and abatement plans need to be discussed in sufficient detail to meet detail requirements of rules.

   c) Water level monitoring must be of sufficient duration to establish a reasonable baseline. Research should be conducted and a discussion of 'seasonal high' or potential high water table levels should be presented.

   d) Raw data and calculations should be provided for review.

   e) Additional discussion regarding horizontal/vertical permeability ratios (kh/kv), subsequent to establishing appropriate permeabilities for the site, would assist in understanding leachate and water migration and the overall suitability of the lithology.

9) Please provide dimensions of the detention pond along with calculations establishing that the pond size is adequate for its intended purpose.

10) It is difficult to determine from the plan sheets if the drainage ditch around the trenching area will provide gravity flow to the detention basin. Please indicate the slope of the ditch on the plans.

11) A closure plan prepared in accordance with proposed Subtitle D (Section 258.30) must be included in the application.

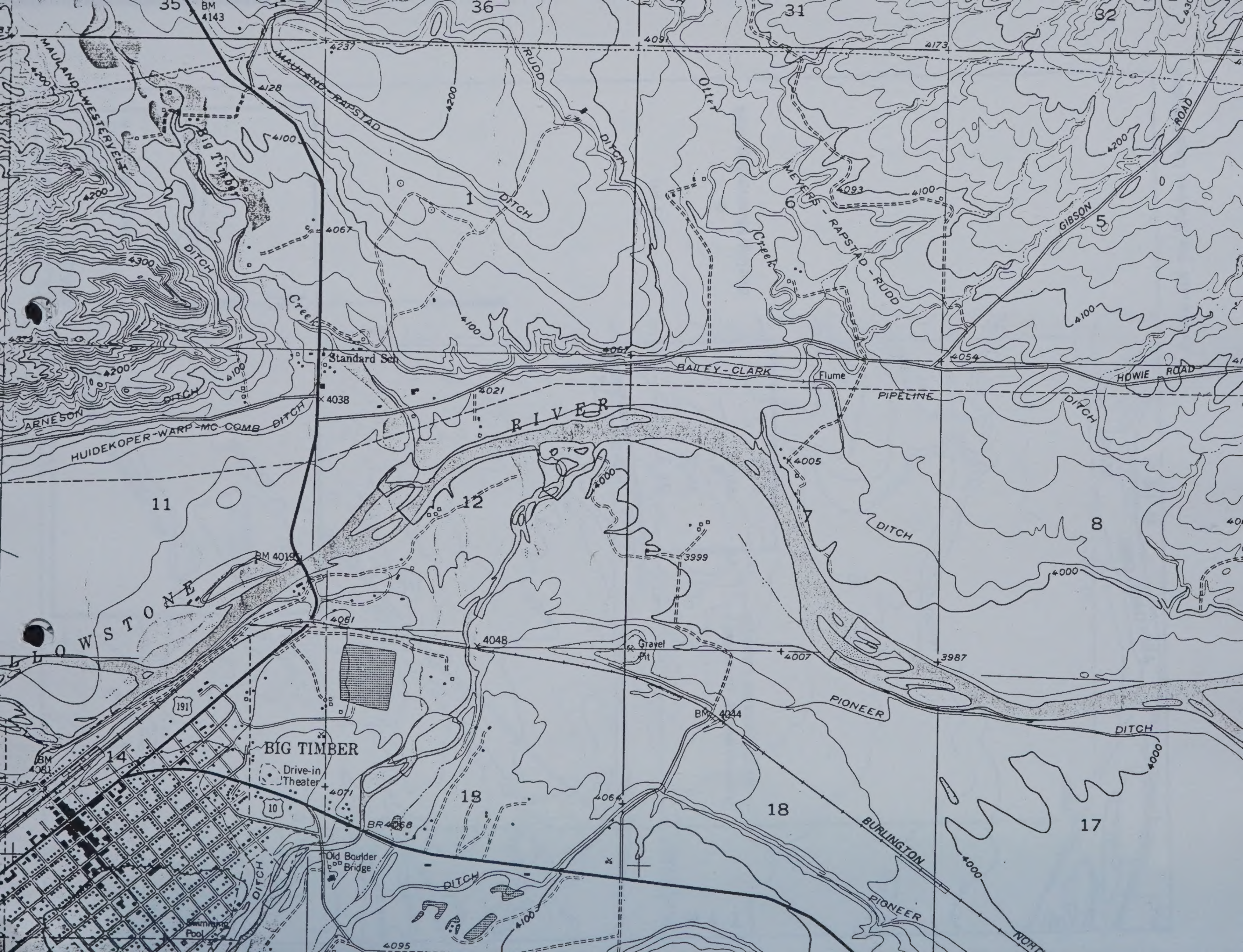
This concludes the Departments review of the Class II Sanitary Landfill Application. Pursuant to ARM 16-14-511, the Department has postponed further processing of the application until the additional information requested in this letter has been provided. If this information is not received within 90 days of the receipt of this letter, a new application must be submitted.

If you have any questions or concerns about this letter of deficiency, please do not hesitate to contact Roger Thorvilson.

Sincerely,

Duane L. Robertson
Bureau Chief

cc: Damshcer & Associates



BIG TIMBER
YELLOWSTONE RIVER
Standard Sch
Drive-in Theater
Old Boulder Bridge
Swimming Pool
Gravel Pit
Flume
PIPELINE
BAILEY-CLARK
HOWIE ROAD
GIBSON ROAD
HUIDEKOPER-WARP-MC COMB DITCH
ARNESON DITCH
MAULAND-WESTERVELT
MAULAND-RAPSTAD
MEYERS-RAPSTAD-RUDD
RUDD DITCH
PIONEER DITCH
BURLINGTON NORTHERN
Big Timber Creek
Otter Creek
191
10
BM 4143
BM 4019
BM 4044
BM 4081
BR 4058
4237
4128
4091
4173
4067
4061
4054
4038
4021
4093
4005
3999
4048
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4071
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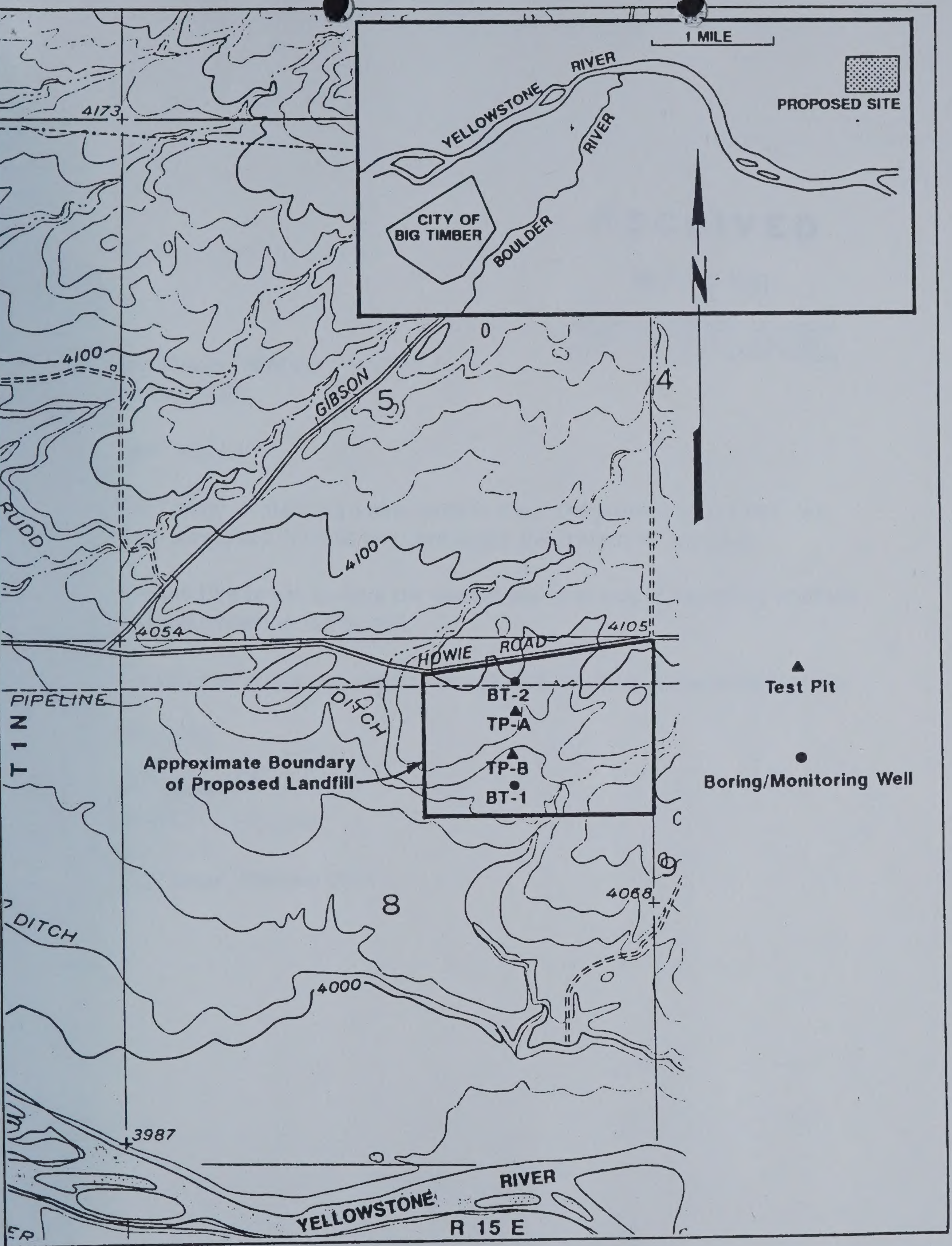
1 MILE
YELLOWSTONE RIVER
PROPOSED SITE
BOULDER RIVER
CITY OF BIG TIMBER
N
4173
4100
GIBSON
5
4
RUDD
4100
4054
4105
HOWIE ROAD
PIPELINE
DITCH
BT-2
TP-A
TP-B
BT-1
Approximate Boundary of Proposed Landfill
Test Pit
Boring/Monitoring Well
T 1 N
9
4068
8
DITCH
4000
3987
RIVER
YELLOWSTONE
R 15 E

Proposed Big Timber Landfill Site

RECEIVED

MAY 15 1990

MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID & HAZARDOUS WASTE BUREAU

Big Timber, Montana
11 May 1990

Dear Friends:

Big Timber is planning a new landfill since the present one is full. We have purchased the land and have begun the process of approval.

I would like to see us have the newest and best way of recycling what we can and disposing of the rest.

I would appreciate any suggestions you may have for accomplishing this.

Sincerely,

Margaret

Margaret L. Huffman
Box 1217
Big Timber, Montana 59011

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

STAN STEPHENS, GOVERNOR

COGSWELL BUILDING

STATE OF MONTANA

FAX # (406) 444-2606

HELENA, MONTANA 59620

May 4,1990

Mr. James Devenny, Mayor
City of Big Timber
City Hall
Big Timber, MT 59011

Subject: Landfill Inspection

Dear Mr. Devenny,

On April 24, 1990 I inspected the Big Timber landfill for compliance with the laws and rules of the State of Montana governing solid waste disposal. Enclosed is a copy of my inspection report.

The items marked "no" on the form are areas where violations were noted. On a separate page I have quoted the rule which was violated and an explanation of the specific problem. These violations need to be corrected immediately to bring your operation into compliance.

I realize that you are attempting to correct the licensing problem and that you are awaiting our action on your pending application. Unfortunately our staffing problems have not improved and we haven't been able to adequately address your application at this time although we have been in contact with Barry Damschen in regards to the issues discussed with you. The Bureau is presently in the process of contracting with a private consulting firm to perform license application review functions. This assistance should relieve some of the backlogged work and your application has been placed in the highest priority group for action.

Thank you for your cooperation in this matter and please do not hesitate to contact me if you have any questions.

Sincerely,

James Wilbur

James Wilbur
Solid & Hazardous Waste Bureau
Telephone (406) 444-1430

Encl.
cc: Ron Fink, R.S., Sweetgrass Co., Box 111, Columbus
JW/jw

Big Timber
proposed Landfill

MONTANA
PRESS CLIPPING SERVICE
A Division of
Montana Press Association
1900 N. Main, Suite C
Helena, MT 59601

The Big Timber Pioneer
Big Timber, Montana
APR 25 1990

New city landfill sites get looks from state inspectors

Big Timber
P.

When it looked like Big Timber's application for a new landfill site was mired in red tape and not going anywhere very fast, some correspondence may have started the wheels rolling again.

Mayor Jim Devenny reported at the April 16 meeting of the Big Timber City Council that after calls to the Solid and Hazardous Waste Division of the Department of Health and Environmental Sciences on April 6 and 13, he could get no committment on how fast the application could be processed.

Devenny then called the governor's office and sent a letter to him on April 19 concerning the situation.

The application for a new landfill to be located northeast of Big Timber was submitted to the state on February 28 by Barry Damschen and Associates, the engineers contracted to develop plans for the new site and closure of the present one.

In a telephone interview with the **Pioneer**, Roger Thorvilson, Solid Waste Division temporary chief in Helena explained the application process. "It involves a preliminary review for completeness," he said.

There are two phases going on at the same time. The first is an environmental assessment and the second is a review of the license under the law. The review leads to a draft document which goes to public review.

One of the problems facing the Solid Waste Division is staffing and demand for services. "The need for aid has increased in the past several years and the staff has remained the same," Thorvilson explained.

The Solid Waste Division presently has 12 applications, including Big Timber, to act upon. According to Thorvilson six to eight of the applications are Class 2, a typical municiple landfill, and some are Class 3, which consist of construction rubble.

Staffed by one and a half people, the division underwent a change with the resignation of Jim Leiter, program manager for the past 12 years. Leiter left Friday, April 20. He will go to work for Damschen and Associates starting May 1.

The wheels have started turning again of the state level. Big Timber City Clerk John Jacobs reported officials were here Monday, April 23 to look at the landfill situation.

According to Jacobs, representatives of the Solid Waste Division said, after their inspection of both landfill sites, the new site looked licenseable and that they would try to have a report in to the state by the next city council meeting.

Presently, the city's portion of the landfill is full and pits set aside for the county to dispose of junk cars are being used for garbage.

The city has an option on property presently owned by Gene Sondeno northeast of Big Timber. The option expires July 1. The council has also approved a bond issue on the June primary ballot seeking approval of up to $450,000 to develop a new landfill and close the old one.

BIG TIMBER SANITARY LANDFILL

OPERATION PLAN
AND
LICENSE APPLICATION

February, 1990

Prepared For:

CITY OF BIG TIMBER
Big Timber, Montana

RECEIVED
JUN 28 1994
MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES

Damschen & Associates, Inc.
CONSULTING ENGINEERS
Helena, Mt.

RECEIVED
MAR 5 1990
Mon ... th ... es
Solid and Hazardous Waste Bureau

D&A

DAMSCHEN & ASSOCIATES, INC.

CONSULTING ENGINEERS

2030 11TH AVENUE • SUITE 11
P.O. BOX 4817 • HELENA, MT 59604
TELEPHONE (406) 449-8627

February 28, 1990

Montana Department of Health & Environmental Sciences
Solid & Hazardous Waste Bureau
Cogswell Building
Helena, MT 59620

Attention: Mr. Jim Leiter

Dear Jim:

Please find enclosed an application submittal on behalf of the City of Big Timber. This application contains this report including three appendices which includes an operation plan of the landfill.

We appreciate your timely assistance and review of this information. The City would like to start using the site as soon as possible. If you have any questions or comments, please call me at your earliest convenience.

Very truly yours,

DAMSCHEN & ASSOCIATES, INC.

Barry E. Damschen, P.E.

Enclosures

cc: City of Big Timber

RECEIVED
MAR 5 1990
Montana Department of Health
and Environmental Sciences
Solid and Hazardous Waste Bureau

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  5. Litter & Access Control

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Appendix B - Soil & Groundwater Data
Appendix C - Landfill Plans (Detached)

BIG TIMBER MONTANA LANDFILL APPLICATION

A. General

The proposed site is located approximately 4 1/2 miles northeast of Big Timber. The City has an option to purchase the site from Eugene Sandeno. The site will serve the City of Big Timber and possibly Sweetgrass County in the future. It is estimated that the site will receive approximately 2,000 tons of waste per year including both Group II and Group III type wastes.

The site is 90 acres in size and is currently used for grazing purposes.

The actual area to be landfilled is located in the southwest area of the site and encompasses approximately 18 acres. It is anticipated that this area will have sufficient capacity to dispose of the waste generated in the City for approximately 61 years, depending upon the quantity of waste generated over the period. The location of the landfill site and areas in which waste will be deposited is shown on the attached plan sheets.

B. Summary of Hydrogeology Of The Site

Included herein as a part of this application is a summary of hydrogeologic conditions of the site. To identify these characteristics three sources of information were obtained and reviewed. These included: 1) backhoe test pits at the site, 2) hydrogeologic investigations provided by Chen-Northern including the installation of four monitoring wells and 3) a review of available water well drill logs in the area. A summary of each report, well logs, etc. from these data sources are summarized in Appendix B. Based on this information the following conclusions can be drawn.

1. Surface Geology

During the initial site investigations thirteen (13) backhoe test pits were excavated on the 90 acre site. The test pits indicated that bedrock is less than 10 feet from the surface in the northern and southern portions of the proposed site. In the central portion of the site (approximately 18 acres), the test pits did not encounter any bedrock to the total depth of the hole (typically 12 feet deep). The soil in these pits is classified as a gray, clay shale and is fairly easy to excavate. Some of the pits had an occasional 3" to 4" diameter rock. It appears from this information that the soils within this 18 acre area will be quite suitable for use as daily cover. ok (Grain size, atterberg limits and permeability tests of these surface materials (0-12' depth) are included in the attached Chen-Northern report in Appendix B.)

2. Hydrogeologic Conditions

A hydrogeologic investigation of the proposed Big Timber landfill site was performed. Tasks completed included: a review of available geologic and hydrogeologic information of the site; installation of one dual completion monitoring well and three single completion monitoring wells; aquifer tests; and excavation and testing of materials from three test pits. Monitoring wells installed during this investigation allowed for the determination of the groundwater flow direction and gradient beneath the landfill site. The depth at which groundwater was encountered varied from 12 feet in Well No. 3 to 42 feet in Well No. 2. Subsurface material encountered in the monitoring well borings included alternating beds of clay, silt, shale, mudstone, and sandstone belonging to the Hell Creek Formation.

Water-bearing sandstone and mudstone beds are under artesian pressure in the areas that are to be landfilled and exhibited relatively low hydraulic conductivities ranging from 1.1×10^{-4} cm/sec. to 3×10^{-4} cm/sec. The hydraulic gradient at the site is approximately 0.02 ft/ft to the southwest. Average flow velocity of groundwater in the aquifers is estimated at 1.8 cm/day.

LAB TEST OR IN-SITU?

During the investigations an intermittent spring was detected in the bottom of the draw approximately 550 feet south of the landfill site. This spring had a flow of approximately 1 gallon per minute. It is anticipated that the spring is recharged from the intermittent flow in the coulee. The landfill plan has been designed to maximize the separation of soil area between the landfill and the groundwater in the area of the coulee.

Laboratory tests on material collected at the base of the proposed landfill site indicate that the base material has a high clay and silt content and exhibits a relatively low permeability of 3.0×10^{-7} when remolded to 95 percent of the maximum laboratory dry density as determined by ASTM D698. An in situ permeability test on the base material indicates that the base material would have an unsaturated permeability similar to the water-bearing sandstone beds after 18 hours of saturation. This situation likely represents the worst case infiltration situation for the landfill. Because of an artesian pressure head of approximately 11 feet in sandstone aquifers beneath the site, clay/shale aquitards with lower permeabilities must be present above and below these aquifers. This indicates that the base material likely becomes less permeable with depth. ?

3. Summary

Based on the test pit data and hydrogeologic investigation prepared by Chen-Northern, it appears that a portion of the proposed site is suitable for use as a Class II landfill. Because of the coulee located on the southeast side of the site and relatively shallow bedrock on the north and south sides of the site, it is recommended that only the south western 18 acres of the site be

landfilled. According to the hydrogeologic analyses conducted by Chen-Northern, it appears that the silty clay and shale material underlying the site are quite impermeable and provide adequate protection to the groundwater below the site. To provide additional protection to the groundwater, it is recommended that the soils in the bottom one foot of the trenches be recompacted to 95% of maximum density prior to any wastes being placed. To provide a sufficient separation between the wastes and the groundwater, the landfill cut and fill plan has also been designed to not excavate soil and place waste in excess of 10 feet below the ground surface. (See enclosed landfill design plans.)

this only still allows a 2' separation

C. Landfill Plan

1. General

A landfill operation plan was developed for the proposed new landfill by Damschen & Associates, Inc. The landfill plan delineates the location of the proposed trenches, drainage structures, fences, roads, buildings as well as existing and proposed base and final elevations. The plan also indicates the estimated quantities of the total soil to be excavated, soil required for daily and final cover and the estimated volume of waste to be placed in the landfill. This information is contained in the plan set that is enclosed. Included in the following paragraphs is a summary of the operation plan features.

2. Sequence Plan

Damschen & Associates, Inc. developed a plan for the orderly filling of refuse in the 18 acre area located in the southcentral area of the site. The plan calls typically for a trench operation. For the most part the trenches will be sloped from north to south to allow for positive drainage. The trenches will be approximately 10 feet deep.

In addition to the area within the trenches, it is proposed to fill waste above the top of the trenches. This will be accomplished by basically extending the trench vertically by utilizing a berm of soil that is excavated from each trench and correspondingly placed on each side of the trench. The sequence of excavating and utilizing the trenches (as indicated on the plans) has been designed to allow for such type of operation without interference between the trench excavation and the existing fill operation. Typical trench excavation and filling details are also indicated on the plans.

how moderate?, 3:1 slope?

In regard to final use it is the intent to final contour the site in order that the site can be used for grazing. To allow for this the slopes will be very moderate. Also the site has been designed to provide adequate soil from the trenching operations to allow for a minimum of 2.5 feet of cover soil over all waste. The plan also calls for all available top soil to be stripped and reapplied after the landfilling has been completed in each area.

3. Life of Site

For the design of the landfill, the engineer calculated volumes of available soil material to be obtained from the trench operations. Then utilizing the assumptions that for every 2.4 yards of waste placed into the landfill one cubic yard of soil will be used to provide daily and intermediate cover and that on the average the entire usable area of the landfill will receive a minimum of 2.5 feet of final cover, the engineer then determined the volume of waste that could be deposited into the landfill. Based on these quantities of waste and soil, the final contours were determined. A breakdown of the estimated soil and waste quantities are indicated on the enclosed table.

NEW BIG TIMBER LANDFILL

DESIGN CRITERIA

ITEM	CUBIC YARDS
Total Volume:	
Trenches	200,000
Above Surface	243,000
Total	443,000
Available Soil:	
Trenches	200,000
Other	0
Total	200,000
Soil Requirements:	
Final Cover (2.5 ft)	77,000
Area Between Trenches	22,000
Daily Cover	101,000
Total	200,000
Volume of Waste:	242,000 cy 121,000 Tons (1,000 lbs/cy)
Estimated Life of Site:	61 Years (2,000 Tons/yr)
Waste to Daily Soil Cover Ratio:	2.4:1

Low

To determine the approximate life of the landfill, the engineer estimates that the in-place density of the waste will be in the neighborhood of 1,000 lbs/cubic yard. This is based on the fact that the City will be utilizing a Track Loader for compacting the waste and applying the daily cover. Several studies have indicated that typically in-place densities of waste at landfills vary from approximately 400 lbs/cubic yard where very little compaction is provided to 800-1,000 lbs/cubic yard where larger (D-8) dozers or track loaders (Cat 973) are used and 1,200-1,400 lbs/cubic yard when landfill compactors with sheepsfoot wheels are used. Therefore the 1,000 lbs/cubic yard in-place density seems to be a realistic estimate for the landfill. Based on this coupled with the estimate that the site will receive approximately 2,000 tons per year of waste, it is projected that the site will have an estimated life of 61 years.

4. Drainage Control

When designing a landfill it is important that two criteria be met concerning drainage. These include: 1) making sure that no run-off that is generated off the site runs onto and over the areas that are filled with waste and 2) making sure that there is positive drainage from the waste filled areas to off the site.

Due to the topography of the area and the design of the trench locations, it is not anticipated that any surface drainage can enter the active landfill area from the west, east and south sides. The plan incorporates a ditch along the northwest, north and northeast sides of the site to divert any run-off in these areas from entering the site in these areas. In regard to drainage within the confines of the landfill areas, the site has been designed to slope away from all areas filled with waste. It is the intent to attain the final contours as designed after each area is completed. During the operation of each trench, it is also intended to fill from the north to the south in order that each trench will drain as it is filled.

5. Leachate Control

Due to the low amounts of moisture that fall in the area coupled with the on and off-site drainage control that has been included in the design of the landfill, it is very unlikely that any significant amount of leachate will be generated at the landfill site. If leachate is generated at the site, it will be important to monitor and contain the leachate on the site. In order to detect and collect any leachate that may be generated in the most effective and economical method possible, the operation plan has been developed such that the base elevation of the various trenches slope in a down gradient direction towards the south side of the landfill. If any leachate is generated to the degree that containment and collection is needed, a collection system could be installed along the southern end of each trench.

443-6447

D. Operation Plan

1. Responsibilities

The responsibility of the operation of the landfill will be with the City of Big Timber. The administrative responsibilities will be through the Mayor and City Council. The day to day operation will be the responsibility of the City foreman hired by the City Council.

2. General Operating Procedure

Currently it is the intent to keep the landfill open to the public on Wednesdays and Saturday afternoons from 1:00 to 5:00 p.m. The City of Big Timber will also dump approximately one packer load per day on Tuesdays, Thursdays and Fridays. The site will utilize a locked gate at the entrance to deter traffic during the times in which the site is not open. A sign at the entrance will indicate hours of operation as well as types of wastes that are acceptable.

3. Trench Excavation

The City will either lease a scraper or contract out the excavation of the trenches as required. The trenches will be excavated in accordance with the landfill plan.

4. Daily Operation Plan

The landfill will utilize a track loader for compacting and providing daily and intermediate cover at the site on each day that the site receives waste. To operate the equipment the City will provide an employee. This employee will also be responsible for controlling traffic and monitoring loads of waste. The landfill will accept only Group II and Group III type wastes at the site. It is expected that the employee will use the track loader to apply the final cover at the site as the trenches are completed. The City will also be responsible for maintaining the roads, etc.

5. Litter and Access Control

The City will install a perimeter fence, around the site as indicated on the plans. The perimeter fence will include hog wire with two strands of barbed wire on top. This fence should prevent illegal entrance of individuals as well as livestock. This fence should also catch litter that escapes the active fill area. the location of this new fence is indicated on the attached plans.

The City also will utilize four portable litter screens similar to those detailed on the plans. These screens shall be placed around the active filling area. The City also will provide labor as deemed necessary to hand pick litter that has accumulated on the litter screens, perimeter fences and within and outside the

landfill area. The City will also install the necessary signs to delineate to the public the location of the active filling areas. This should prevent indiscriminate dumping at the landfill site. If necessary, local law enforcement agencies will be used to prevent littering and indiscriminate dumping at the entrance gate and access roads leading to the site.

APPENDIX A

LICENSE APPLICATION

DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES

TED SCHWINDEN, GOVERNOR

COGSWELL BUILDING

STATE OF MONTANA

Solid & Hazardous Waste Bureau
Telephone: (406) 444-2821

HELENA, MONTANA 59620

CHECKLIST TO INSURE THAT YOUR APPLICATION IS COMPLETE

Please number or label the attachments or enclosures that you have included with your application form and note those which are included below. (Note: Unless all the needed enclosures are included, it is unlikely that your application for a license will be considered complete.) Please return this form with your application.

NA 1) Copy of lease or rental agreement. (if necessary, from item #4)

Plans 2) Map of city or county. (from item #5a)

Plans 3) Plan of site. (from item #5b)

Plans 4) Topographic map. (if necessary, from item #10 or item #13)

Report 5) Well logs, other documentation of depth to groundwater. (May be included in hydrogeological report, from item #11)

None 6) Springs indicated on map. (if necessary, from item #13)

Report 7) Hydrogeological report. (from item #14)

Report 8) Groundwater Monitoring plan. (from item #15)

Plans 9) Operation and maintenance plan. (from item #16)

Plans 10) Cut-and-Fill plan. (from item #17)

Attached 11) List af adjacent property owners. (from item #21)

Report 12) Calculations of site life. (from item #22)

Plans 13) Closure plan. (from item #23)

Attached 14) Indication of insurance and statement regarding liability coverage. (from item #25)

Signature of Applicant X James G Devenny

Date of Completion X Feb 28, 1990

4/88/swl

AN EQUAL OPPORTUNITY EMPLOYER

MONTANA DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES
Solid & Hazardous Waste Bureau
Cogswell Building, Room B-201
Helena, Montana 59620

APPLICATION FOR A SOLID WASTE MANAGEMENT SYSTEM LICENSE

1. Name of proposed facility: City of Big Timber Class II Sanitary Landfill

Address of proposed facility: 3 miles east of Big Timber

Name of applicant: City of Big Timber

Address of applicant: City Hall, Big Timber, Montana 59011

Facility telephone: None Other telephone: 932-5610

2. This application is for a: (x) solid waste disposal site, ( ) container site (green box and bulk containers), ( ) transfer station, ( ) resource recovery or processing facility, ( ) other (please specify) ________

3. a) Legal description of proposed location: NE ¼, Section 8, T1N, R15E

b) General description of facility location: Located approximately four miles east of Big Timber on the Howie Road

4. If you are not the owner of the premises, give name and address of lessor who holds title to the property and attach a copy of the lease or rental agreement. Copy attached: (Buy-Sell Agreement) (x) Yes ( ) No

Name: Eugene & Judy Sondeno Address: Box 3762 HC88, Big Timber, MT 59011

5. Please attach the following:

a) Map of city or county showing the proposed location of facility, with indications noting adjacent residences and access roadways. Map attached? (x) Yes ( ) No

b) Plan of proposed facility showing the type and adequacy of fences for litter control and access control, and location of buildings and on-site roadways. Plan attached? (x) Yes ( ) No

6. Total acreage of proposed site: 90 acres

Acreage usable for the solid waste system: 18 acres

7. Population to be served by solid waste management system: 2,000

8. Will bridges and roads support loaded vehicles? (x) Yes ( ) No

9. Is any portion of site within 100 year floodplain? ( ) Yes (x) No

(continued on page 2)

10. Are natural drainages found within the site? (If "yes", indicate on map or furnish a topographic map.) (x) Yes ( ) No

11. Depth to groundwater (attach copies of well logs and site-specific hydrogeological report): 12 to 42 feet

12. Distance from public or private water supplies (indicate locations of wells on map): See Map in Appendix B

13. Are there springs located within one mile of site? (If "yes", indicate locations on map.) See Attached Map in Appendix B (x) Yes ( ) No

14. Attach hydrogeological and soil information on the proposed site, including a soil profile to a depth ten (10) to twenty (20) feet below lowest point solid waste will be deposited. Hydrogeological report attached: (x) Yes ( ) No

15. In order to properly characterize and evaluate the impact of the proposed site on groundwater resources, it is nearly always necessary to plan a groundwater monitoring system for landfills. Usually, this plan will be prepared by a qualified consultant. Have you included such a plan for this proposed site, if the site is intended for burial of wastes? (x) Yes ( ) No

16. Attach operation and maintenance plan. Include days and hours site open, fencing and access control, equipment used at site, how traffic will be directed and controlled, general description of solid waste management system, maintenance schedule regarding handling and disposal of solid wastes, provisions for litter control, types of waste to be accepted, proposed use of the land after fill area completed, person(s) responsible for operation and maintenance of solid waste management system. The operation and maintenance plan must indicate what measures will be taken to insure that drainage is properly handled in order to keep water from entering the waste burial area. Please refer to Administrative Rules of Montana (ARM), Rules 16.14.520 and 16.14.521 for minimum operation and maintenance requirements.
Plan attached: (x) Yes ( ) No

17. Few sites can be properly planned or operated without a "cut-and-fill" plan. Generally, this plan must be prepared by a qualified individual with experience in landfill design. Have you included a plan of this kind with your application? (x) Yes ( ) No

18. Will open burning of untreated wood waste be a part of the operation and maintenance plan? (x) Yes ( ) No

19. Will any special or unusual wastes (those which require special handling or present unique environmental hazards) be accepted? ( ) Yes (x) No

If "yes", briefly describe the wastes (use additional sheet if necessary):

20. Do you plan to accept household quantities of hazardous wastes and/or hazardous wastes from conditionally exempt generators? (Note: These types and quantities of waste may be legally accepted at state licensed "Class II" landfill facililities.) (x) Yes ( ) No

(continued on page 3)

21. Describe adjacent use of land and attach a list of names and addresses of persons owning land adjacent to the proposed facility:

Grazing for horses and cows

List Attached: (x) Yes ( ) No

22. Describe the estimated life of the facility and attach a description of the method used to calculate this figure. Description attached: (x) Yes ( ) No
Estimated life: 61 years

23. Attach a closure plan for the landfill including final cover soil specifications, showing elevations and drainage details, revegetation requirements and other pertinent details of site closure. Address the proposed use of the landfill upon completion. Plan attached: (x) Yes ( ) No

24. What is the proposed opening date for this facility? As soon as license is issued

25. Provide name and address of insuror of facility and/or attach copy of your general liability insurance policy. Provide a statement regarding the limits of the policy for sudden and non-sudden liability coverage.
Statement of Coverage attached: (x) Yes ( ) No

Name of Insuror: Montana Municipal Ins. Address: Helena, MT

26. Will underground tanks or lines be located at the site? ( ) Yes (x) No

If "yes" have you completed EPA form 7530 (11-85) Rev. 2-86, Notification for Underground Storage Tanks? ( ) Yes ( ) No

If "yes", what is your facility I.D. Number?

****

27. I herby certify that the site of the planned solid waste management system is in accordance with local government zoning and ordinances (to be signed by appropriate local government official having knowledge of local zoning ordinances).

Signature: James G Devenny Title: Mayor

Representing: City of Big Timber Date: Feb 28, 1990
(city or county)

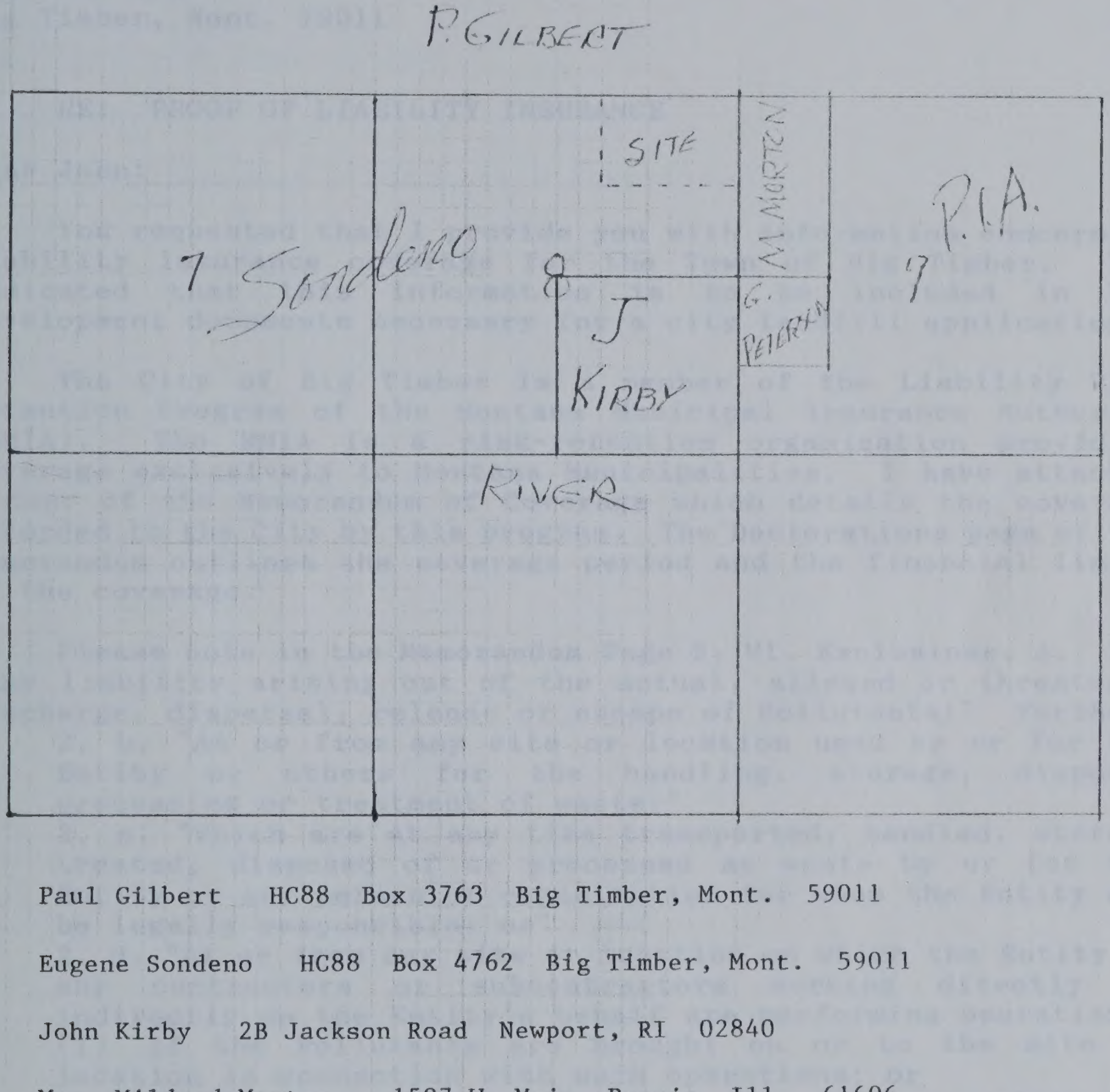
****

I am a party responsible for operation of this proposed facility. I certify that the above described solid waste management system will be constructed and operated in accordance with Section 75-10-201 through 75-10-233, Montana Code Annotated (MCA), the rules adopted pursuant thereto, and in accordance with conditions which have or may be imposed in the license.

Signature: (to be signed by applicant) James G Devenny

Title: Mayor Date: Feb 28, 1990

DANA KEPNER COMPANY OF MONTANA
3206 Conrad, Rd.   Billings, MT. 59102
P.O. Box 23167   Billings, MT. 59104
(406) 656-5656   Toll Free 1-800-332-7645
KEPNER


P. GILBERT
SITE
M. MORTEN
P.I.A.
7
7
Sondeno
J
KIRBY
G. PETERSON
RIVER

Paul Gilbert   HC88   Box 3763   Big Timber, Mont.   59011

Eugene Sondeno   HC88   Box 4762   Big Timber, Mont.   59011

John Kirby   2B Jackson Road   Newport, RI   02840

Mrs. Mildred Morton   1507 W. Main   Peoria, Ill.   61606

Mrs. Gwen Peterson   P.O. Box 1255   Big Timber, Mont.   59011

Property Investment Associates   P.O. Box 396   Big Timber, Mont.   59011

"Serving The Waterworks Industry For Over 50 Years"

Montana Municipal Insurance Authority

February 21, 1990

Mr. John Jacobs
City Clerk
City of Big Timber
P.O. Box 416
Big Timber, Mont. 59011

RE: PROOF OF LIABILITY INSURANCE

Dear John:

You requested that I provide you with information concerning liability insurance coverage for the Town of Big Timber. You indicated that this information is to be included in the development documents necessary for a city landfill application.

The City of Big Timber is a member of the Liability Risk Retention Program of the Montana Municipal Insurance Authority (MMIA). The MMIA is a risk-retention organization providing coverage exclusively to Montana Municipalities. I have attached a copy of the Memorandum of Coverage which details the coverage afforded to the City by this program. The Declarations page of the Memorandum outlines the coverage period and the financial limits of the coverage.

Please note in the Memorandum Page 5, VI. Exclusions, A., 2., "Any liability arising out of the actual, alleged or threatened discharge, dispersal, release or escape of Pollutants:" Further,

> 2. b. "At or from any site or location used by or for the Entity or others for the handling, storage, disposal processing or treatment of waste;"
>
> 2. c. "Which are at any time transported, handled, stored, treated, disposed of or processed as waste by or for the Entity or any person or organization for whom the Entity may be legally responsible: or"
>
> 2. d. "At or from any site or location on which the Entity or any contractors or subcontractors working directly or indirectly on the Entity's behalf are performing operations:
> (1) If the Pollutants are brought on or to the site or location in connection with such operations; or
> (2) If the operations are to test for, monitor, clean up, remove, contain, treat, detoxify, or neutralize the Pollutants."

The Memorandum of Coverage should be reviewed for a complete understanding of coverage and exclusions relating to landfill operations. I bring the aforementioned items to your attention in that landfill activities often involve this type of activity.

MAIN OFFICE: P.O. Box 1704, Helena, Montana 59624 (406) 442-8768
INSURANCE COORDINATOR: P.O. Box 785, Helena, Montana 59624 (406) 443-0907 In MT: 1-800-635-3089

I believe that this information will assist you with the information necessary to pursue your landfill development process. If I can be of further assistance do not hesitate to contact me.

Sincerely,

Bob Worthington
MMIA Insurance Coordinator

enclosures

cc: Barry Damschen - Damschen & Associates

Mo[redacted]rance Authority

MEMORANDUM OF LIABILITY COVERAGE

MEMORANDUM #
L-0079-89

DECLARATIONS

ENTITY COVERED: CITY OF BIG TIMBER MONTANA

MAILING ADDRESS: P.O. BOX 416
BIG TIMBER, MONT. 59011

COVERAGE PERIOD: FROM: JUL 1, 1989 TO: JUL 1, 1990 12:01 A.M.

DEPOSIT PREMIUM: $5,141.00

DEDUCTIBLE: $500.00 PER OCCURENCE

MAXIMUM POLICY LIMIT: $1,500,000.00 PER OCCURENCE

Endorsements Attached:

By

MMIA Authorized Representative

MEMORANDUM OF LIABILITY COVERAGE FOR THE
MONTANA MUNICIPAL INSURANCE AUTHORITY

EFFECTIVE JULY 1, 1988

I. COVERAGE

In consideration of the payment of premium, the Montana Municipal Insurance Authority (the Authority) will pay on behalf of the Entity any Covered Loss which the Entity shall become legally obligated to pay as damages because of:

A. BODILY INJURY or PROPERTY DAMAGE

B. PERSONAL INJURY

C. PUBLIC OFFICIALS ERRORS AND OMISSIONS

as those terms are herein defined and to which this Memorandum applies, caused by an Occurrence during the COVERAGE PERIOD, and the Authority shall have the right and duty to defend any suit against the Entity claiming monetary damages for which coverage is afforded under this Memorandum for an Occurrence during the Coverage Period, even if any of the allegations or the suit are groundless, false, or fraudulent, and may make such investigation and settlement of any claim or suit as it deems expedient. The Authority shall not be obligated to pay any claim or judgment or to defend any suit after the applicable limits of liability have been exhausted by payment of judgments and settlements.

II. DEFINITIONS

Throughout this Memorandum, words and phrases that appear capitalized have special meaning and are defined in this Section. Words that appear entirely in capital letters have reference to the like-titled section in this Memorandum or in the DECLARATIONS.

A. "Aircraft" -- means a vehicle designed for the transport of persons or property principally in the air.

B. "Additional Covered Party" -- means any other governmental or intergovernmental agency, board or commission of which the Entity is a member or participant and which agency board or commission is named on this policy as an Additional Covered Party by endorsement.

C. "Authority" -- means the Montana Municipal Insurance Authority.

D. "Automobile" -- means a land motor vehicle, trailer or semi-trailer.

E. "Bodily Injury" -- means physical injury, sickness or disease sustained by a person, including death resulting therefrom.

F. "Covered Party" -- means any person or Entity set forth in Section V of this Memorandum.

G. "Covered Loss" -- means that portion of the Loss that falls within the MAXIMUM COVERAGE LIMIT and above the DEDUCTIBLE indicated in the DECLARATIONS and is not covered by other available insurance.

H. "Dam" -- means any artificial barrier, together with appurtenant works, used to impound or divert water with an impounding capacity of 50 acre feet or greater, and shall include a barrier designated as a "high hazard dam" pursuant to Montana Code 85-15-106 and 85-15-209.

I. "Damages" -- means Loss and Defense Costs.

J. "Defense Costs" -- means all fees and expenses caused by and relating to the adjustment, investigation, defense or appeal of a claim seeking monetary damages for which coverage is afforded under this Memorandum, including attorney's fees, court costs and interest on judgments accruing after entry of judgment. However, Defense Costs shall not include the office expenses or salaries of employees or officials of the Authority or any Entity nor expenses of claims administrators engaged by any Entity.

K. "Entity" -- means the city or town named in the DECLARATIONS, including any and all commissions, agencies, districts, authorities, councils or similar entities coming under the Entity's direction or control or for which the Entity's council members sit as the sole governing body.

L. "Loss" -- means the sum actually paid or payable in cash in the settlement or satisfaction of losses for which the Entity is liable either by adjudication or by compromise after making proper deduction for all recoveries and salvages.

M. "Memorandum" -- means this Memorandum of Liability Coverage for the Montana Municipal Insurance Authority and any endorsements attached thereto.

N. "Nuclear Material" -- means source material, special nuclear material, or by-product material. Source Material, Special Nuclear Material and By-Product Material have the meanings given to them by the Atomic Energy Act of 1954 or in any law amendatory thereto.

O. "Occurrence" -- means:

1. With respect to Bodily Injury or Property Damage, an accident or event which results during the COVERAGE PERIOD, in Bodily Injury or Property Damage neither expected nor intended from the standpoint of the Covered Party, or an assault or battery committed by, at the direction of or with the consent of the Covered Party for the purpose of protecting persons from injury or death or property damage;

2. With respect to Personal Injury, the commission during the COVERAGE PERIOD of any offense described in the definition of Personal Injury;

3. With respect to Public Officials Errors and Omissions, actual or alleged conduct during the COVERAGE PERIOD as described in the definition of Public Officials Errors and Omissions.

4. With respect to Bodily Injury, Property Damage, Personal Injury, and Public Officials Errors and Omissions, all injuries or damages arising out of a continuous or repeated exposure to substantially the same general conditions shall be considered arising out of one Occurrence.

P. "Personal Injury" -- means injury, other than Bodily Injury, including but not limited to one or more of the following:

1. False arrest, detention, imprisonment, or malicious prosecution;

2. Wrongful entry or eviction or other invasion of private occupancy;

3. The publication or utterance of a libel or slander, including disparaging statements concerning the condition, value, quality or use of real or personal property, or a publication or utterance in violation of the rights of privacy;

4. Unlawful discrimination or violation of civil rights;

5. Shock, fright, mental anguish or mental injury.

6. Assault and battery, committed by, at the discretion of or with the consent of a Covered Party, for the purpose of protecting persons from injury or death or property from damage.

Q. "Pollutants" -- means any solid, liquid, gaseous, or thermal irritant or contaminant, including smoke, vapor, soot, fumes, acids, alkalis, chemicals, and waste. Waste includes materials to be recycled, reconditioned or reclaimed.

R. "Property Damage" -- means:

1. Physical injury to or destruction of tangible property which occurs during the COVERAGE PERIOD, including loss of use thereof at any time resulting therefrom; or

2. Loss of use of tangible property that is not physically injured provided such loss of use is caused by an Occurrence during the COVERAGE PERIOD.

S. "Public Officials Errors and Omissions" -- means any act, omission, neglect or breach of duty, including nonfeasance, misfeasance, and malfeasance by the Covered Party, but shall not mean or include Bodily Injury, Personal Injury, or Property Damage.

T. "Special Event"--means an event of leisure, sports, recreations, entertainment, or public interest value lasting a specific period of time.

III. DEDUCTIBLE

The obligation of the Authority to pay damages on behalf of the Entity shall apply only to the amount of Loss and Defense Costs in excess of the DEDUCTIBLE amount stated in the DECLARATIONS. The DEDUCTIBLE amount so stated applies on a per occurrence basis to all Loss and Defense Costs caused by an Occurrence.

The terms of the Memorandum, including those with respect to the Authority's rights and duties for the defense of suits, apply irrespective of the application of the DEDUCTIBLE amount.

The Authority may pay any part or all of the DEDUCTIBLE amount to effect a settlement of any claim or suit, and upon notification of the action, the Entity shall promptly reimburse the Authority for such part of the DEDUCTIBLE amount as has been paid by the Authority.

IV. THE AUTHORITY'S LIMIT OF LIABILITY

The Authority's liability for Damages as the result of any one Occurrence shall be only the MAXIMUM POLICY LIMIT less the amount of the Entity's DEDUCTIBLE as specified in the DECLARATIONS.

For the purpose of determining the limit of liability, all Damages arising out of continuous or repeated exposure to substantially the same general conditions shall be considered as arising out of one Occurrence.

In the event that any combination of the COVERAGES applies to the same Entity for a loss, claim or suit, the Authority's liability shall be limited to the LIMIT OF LIABILITY for one Occurrence.

V. COVERED PARTY

Each of the following is a Covered Party under this Memorandum:

A. The Entity.

B. While acting within the scope of his or her duties for the Entity:

  1. any member of the governing body of the Entity;

  2. any member of any of the boards or commissions of the Entity;

  3. any elected or appointed officials of the Entity;

  4. any employee or authorized volunteer of the Entity.

C. Additional Covered Party.

VI. EXCLUSIONS

A. This Memorandum does not cover:

  1. Any liability arising out of claims, demands, or actions seeking relief or redress in any form other than money damages; or for fees or expenses relating to claims, demands or actions seeking relief or redress in any form other than money damages.

  2. Any liability arising out of the actual, alleged or threatened discharge, dispersal, release or escape of Pollutants:

     a. At or from premises owned, leased to or occupied by the Entity, but his exclusion does not apply if an actual discharge, dispersal, release or escape of Pollutants arises out of an Automobile not owned by, leased to, hired by or loaned to the Entity while being used on a public street or road owned or maintained by the Entity;

     b. At or from any site or location used by or for the Entity or others for the handling, storage, disposal processing or treatment of waste;

c. Which are at any time transported, handled, stored, treated, disposed of or processed as waste by or for the Entity or any person or organization for whom the Entity may be legally responsible; or

d. At or from any site or location on which the Entity or any contractors or subcontractors working directly or indirectly on the Entity's behalf are performing operations:

(1) If the Pollutants are brought on or to the site or location in connection with such operations; or

(2) If the operations are to test for, monitor, clean up, remove, contain, treat, detoxify, or neutralize the Pollutants.

This exclusion does not apply, however, to Bodily Injury or Property Damage caused by heat, smoke, or fumes from a hostile fire. As used in this exclusion, a hostile fire means one which becomes uncontrollable or breaks out where it was not intended to be.

3. Any loss, cost or expense arising out of any governmental directions or request that the Entity test for, monitor, clean up, remove, contain, treat, detoxify or neutralize Pollutants.

4. Any liability arising out of unlawful discrimination, wrongful termination or the violation of civil rights of any employee or official of the Entity.

5. Bodily injury to an employee of the Entity arising out of and in the course of employment by the Entity, or for the spouse, child, parent, brother or sister of that employee as a consequence of actions of the employee arising out of and in the course of his/her employment by the Entity.

This exclusion applies whether the Entity may be liable as an employer or in any other capacity, except with respect to liability of others assumed under contract.

6. Any obligation for which the Entity or any insurance company as its insurer may be held liable under any workers' compensation or disability benefits law or any similar law.

7. Any liability arising out of the ownership or operation of any hospital or airport, or any activities associated with or related to the ownership or operation of any hospital or airport.

8. Any liability arising out of or in connection with the operation of any hospital, clinic, or established health care facilities owned or operated by the Entity due to:

   a. The rendering of or failure to render:

      (1) Medical, surgical, dental, X-ray or nursing service or treatment, or the furnishing of food or beverages in connection therewith;

      (2) Any service or treatment conducive to health or of a professional nature or;

      (3) Any cosmetic or tonsorial service or treatment.

   b. The furnishing of or dispensing of drugs or medical, dental, or surgical supplies or appliances.

   This exclusion shall not apply, however, to any professional activities arising out of the performance of emergency medical technicians or paramedics.

9. Any liability arising out of losses arising out of partial or complete structural failure of a Dam.

10. Any liability arising out of fines, punitive damages, penalties, exemplary damages, or damage multiples such as double or treble damages awardable pursuant to statute.

11. Any liability for property damage to property owned by the Entity, or property rented to or leased to the Entity where it has assumed liability for damage to or destruction of such property, unless the Entity would have been liable in the absence of such assumption of liability.

12. Any liability arising out of the ownership, operation, use or maintenance of any Aircraft.

13. Any liability arising out of or based upon the principles of eminent domain, condemnation, inverse condemnation, or land use regulation, including but not limited to, claims for precondemnation activities, interim takings, down-zoning, zoning, general planning regulations, easements, taking, nuisance, deprivation of constitutional or civil rights, property damage or diminution in value

related thereto, by whatever name, regardless of whether such claims are made directly against the Entity or pursuant to an agreement entered into by or on behalf of the Entity.

14. Any liability arising out of the operation of any transit authority, transit system, or public transportation system owned or operated by the Entity, except a transit system operating over non-fixed route systems such as dial-a-ride, senior citizen transportation, or handicapped transportation.

15. Any liability arising out of the failure to supply or provide an adequate supply of gas, water or electricity when such failure is a result of the inadequacy of the Entity's facilities to supply or produce sufficient gas, water or electricity to meet the demand.

16. Any liability arising out of Bodily Injury or Property Damage arising out of the hazardous properties of Nuclear Material.

17. Any liability arising out of sexual abuse, mistreatment, or harassment.

18. Any liability arising out of the following Special Events:

    a. Air shows;

    b. Circuses;

    c. Rodeos;

    d. Fireworks;

    e. Animal racing;

    f. Carnivals;

    g. Vehicle racing;

    h. Rock concerts;

    i. Water sports other than the operation of municipal swimming pools, lakes or other designated swimming areas;

    j. Boxing or other martial arts.

19. Any liability arising out of the willful violation of a penal statute, ordinance or regulation committed by or with the knowledge or consent of the Entity; except that no violation by any Covered Party shall be imputed to any other Covered Party.

20. Any liability arising out of a publication or utterance concerning any organization or business enterprise, or its products or service, made by or at the direction of any Entity with knowledge of the falsity thereof.

21. Any liability arising out of any employee benefit plan, whether the plan is voluntarily established by the Entity or mandated by statutes, because of unlawful discrimination.

22. Any liability arising out of failure to refund taxes, fees or assessments.

23. Any liability arising out of failure to perform, or breach of, a contractual obligation, including default of municipal financing instruments such as, but not limited to:

    1) Special obligation bonds
    2) Special tax bonds
    3) Special Assessment Bonds and Notes
    4) Revenue Bonds
    5) Industrial Revenue Bonds
    6) Moral Obligation Bonds
    7) Short-term Debt Bonds
    8) Particular Obligations Issued pursuant to Federal Programs

24. Any liability of the Covered Party arising in whole or in part out of the Covered Party obtaining remuneration or financial gain to which the Covered Party was not legally entitled.

25. Any liability arising out of any deliberately dishonest or fraudulent act or omission, or any criminal or malicious act or omission, or any willful violation of the law.

    However, the Covered Party shall be protected under the terms of this coverage for any claims against them by reason of any alleged dishonesty on the part of the Covered Party unless a judgment or other final adjudication thereof adverse to the Covered Party shall establish that acts of deliberate dishonesty committed by the Covered Party were material to the claim.

26. Any liability arising out of estimates of probable costs or cost estimates being exceeded or faulty preparation of bid specifications or plans including architectural plans or failures to award contracts in accordance with statute or ordinance which under law must be submitted for bids.

27. Any liability arising out of failure to perform, or breach of, a contractual obligation.

28. The Employee Retirement Income Security Act of 1974, and any law amendatory thereof, or similar provisions of any federal, state, or local statutory law or common law.

VII. CONDITIONS

A. The Entity agrees to pay all risk premiums, risk premium adjustments, deferred risk premium adjustments, debt service premiums and supplemental debt service premiums as specified in the Liability Insurance Protection Program Agreement.

B. The Authority shall be permitted but not obligated to inspect the Entity's property and operations at any time. Neither such right to make inspections nor the making thereof nor any report thereon shall constitute an undertaking on behalf of or for the benefit of the Entity or others to determine or warrant that such property or operations are safe. The Authority may examine the Entity's books and records at any time during the Coverage Period and extensions thereof and within three years after the final termination of this Memorandum as far as they relate to the subject matter of this Memorandum.

C. Entity's duty in the event of any Occurrence, claim or suit:

1. In the event of an Occurrence reasonably likely to involve the Authority, written notice containing particulars sufficient to identify the Entity and also reasonably obtainable information with respect to the time, place and circumstances thereof, and the names and addresses of the Entity(ies) and of available witnesses, shall be given by or for the Entity to the Authority or any of its authorized agents as soon as practicable.

2. If a claim is made or suit brought against the Entity, the Entity shall be obligated upon demand to forward to the Authority every demand, notice, summons or other process received by Entity or Entity's representative.

3. The Entity shall cooperate with the Authority and upon its request assist in enforcing any right of contribution

or indemnity against any person or organization who may be liable to the Entity because of an Occurrence with respect to which coverage is afforded under this Agreement; and the Entity shall attend hearings and trials and assist in securing and giving evidence and obtaining the attendance of witnesses. The Entity shall not, except at its own cost, voluntarily make any payment, assume any obligation or incur any expense.

D. Bankruptcy or Insolvency of the Entity shall not relieve the Authority of any of its obligations hereunder.

E. If the Entity has collectible insurance for Damages also covered hereunder (whether on a primary, excess or contingent basis), the coverage provided by this Memorandum shall be in excess of and shall not contribute with, to such other insurance. This clause does not apply with respect to excess insurance purchased specifically to be in excess of this Memorandum.

F. An Occurrence with a duration of more than one coverage period shall be treated as a single Occurrence arising during the COVERAGE PERIOD when the Occurrence began.

G. This Memorandum may be cancelled by the Authority for non-payment of premium in accordance with Article VI, Expulsion from the Pooled Insurance Program, Section 6.4 of the Liability Risk Retention Program Agreement. The Authority shall mail written notice to the Entity at the address shown in this Memorandum stating when such cancellation shall be effective.

The mailing of notice as aforesaid shall be sufficient proof of notice. The time of surrender or the effective date and hour of cancellation stated in the notice shall become the end of the Coverage Period. Delivery of such written notice by the Authority shall be the equivalent to mailing.

H. No action shall lie against the Authority with respect to the coverages and related provisions defined in this Memorandum unless, as a condition precedent thereto, there shall have been full compliance with all the terms of this Memorandum, nor until the amount of the Entity's obligations to pay shall have been finally determined either by judgment against the Entity after actual trial or by written agreement of the Entity, the claimant and the Authority. Any person or organization or the representative thereof who has secured such judgment or written agreement shall thereafter be entitled to recovery under this Memorandum to the extent of the coverage afforded by this Memorandum. No person or entity shall have any right under this Memorandum to join the Authority as a party to any action against the Entity to determine the Entity's liability, nor shall the Authority be impleaded by the Entity or its legal representative.

I. The Authority shall be subrogated to the extent of any payment hereunder to all the Entity's rights of recovery thereof, and the Entity shall do nothing after loss to prejudice such right and shall do everything necessary to secure such right. Any amount so recovered shall be apportioned as follows:

1. The highest layer of coverage shall be reimbursed first and if there are sufficient recoveries, then the next highest layer until all recoveries are used up.

2. The expenses of all such recovery proceedings shall be paid before any reimbursements are made for the highest layer of coverage. If there is no recovery in the proceedings conducted by the Authority, it shall bear the expenses thereof.

J. Assignment of interest under this Memorandum shall not bind the Authority unless and until its consent is endorsed herein.

K. Notice to any agent or knowledge possessed by any agent or by any other person shall not effect a waiver or change in any part of this Memorandum or stop the Authority from asserting any right under the terms of this Memorandum, nor shall the terms of this Memorandum be waived or changed, except by endorsement issued to form a part hereof.

VIII

The Authority will pay, in addition to the applicable limit of liability:

1. All expenses incurred by the Authority, all costs taxed against the Covered Party at any inquest or criminal proceeding or in any suit defended by the Authority and all interest on the entry of any judgment therein which accrues after entry of the judgment and before the Authority has paid or tendered or deposited in court that part of the judgment which does not exceed the limit of the Authority's liability thereon;

2. Premiums on appeal bonds required in any such suit, premiums on bonds to release attachments in any such suit for an amount not in excess of the applicable limit of liability;

3. Expenses incurred by the Covered Party for first aid to others at the time of an accident, for Bodily Injury to which this policy applies;

4. Reasonable expenses incurred by the Covered Party at the Authority's request, including actual loss of wages or salary (but not loss of other income) not to exceed $50 per day because of his attendance at hearings or trials at such request.

determine the Entity's liability, nor shall the Authority be impleaded by the Entity or its legal representative.

[illegible] of any [illegible] of recovery [illegible] loss to prejudice such right and shall do whatever is necessary to secure such right. Any amount so recovered shall be apportioned as follows:

1. The highest layer of coverage shall be reimbursed first and if there are sufficient recoveries, then the next highest layer until all recoveries are used up.

2. The expenses of all such recovery proceedings shall be paid before any reimbursements are made for the highest layer of coverage. If there is no recovery in the proceedings conducted by the Authority, it shall bear the expenses thereof.

J. Assignment of interest under this Memorandum shall not bind the Authority unless and until its consent is endorsed hereon.

K. Notice to any agent or knowledge possessed by any agent or by any other person shall not effect a waiver or change in any part of this Memorandum or estop the Authority from asserting any right under the terms of this Memorandum, nor shall the terms of this Memorandum be waived or changed, except by endorsement issued to form a part hereof.

VIII

The Authority will pay, in addition to the applicable limit of liability:

1. All expenses incurred by the Authority, all costs taxed against the Covered Party at any [illegible] or criminal proceeding or in any suit defended by the Authority and all interest on the entry of any judgment therein which accrues after entry of the judgment and before the Authority has paid or tendered or deposited in court that part of the judgment which does not exceed the limit of the Authority's liability thereon;

2. Premiums on appeal bonds required in any such suit, premiums on bonds to release attachments in any such suit for an amount not in excess of the applicable limit of liability;

3. Expenses incurred by the Covered Party for first aid to others at the time of an accident, for bodily injury to which this policy applies;

MEMORANDUM OF LIABILITY COVERAGE FOR THE
MONTANA MUNICIPAL INSURANCE AUTHORITY
AMENDATORY ENDORSEMENT

It is understood and agreed that Exclusion 18(k) be incorporated in the Memorandum of Coverage, effective February 1, 1990, amending Article VI, Section A., Number 18 to exclude from coverage any liability arising out of the following Special Events:

k. Skateboard exhibition, competition or racing.

It is further understood and agreed that Exclusion 29 be incorporated in the Memorandum of coverage, effective February 1, 1990, amending Article VI, Section A., to exclude from coverage:

29. Any liability arising out of the use of a structure designed to facilitate the operation or use of a skateboard, whether or not the structure is utilized for skateboarding purposes.

All other terms and conditions of the Memorandum of Coverage remain unchanged.

DATE: FEBRUARY 1, 1990 CERTIFICATE NUMBER: L-0079-89

ISSUED TO: CITY OF BIG TIMBER MONTANA

Authorized Representative Of The
Montana Municipal Insurance Authority

APPENDIX B

SOIL & GROUNDWATER DATA

HYDROGEOLOGIC INVESTIGATION REPORT
PROPOSED BIG TIMBER LANDFILL SITE
BIG TIMBER, MONTANA

Chen-Northern, Inc.

Consulting Engineers and Scientists

1610 B Street
P.O. Box 4699
Helena, Montana 59604

406 443-5210
406 449-3729 Facsimile

HYDROGEOLOGIC INVESTIGATION REPORT
PROPOSED BIG TIMBER LANDFILL SITE
BIG TIMBER, MONTANA

Prepared for:

City of Big Timber

Big Timber, Montana

Prepared by:

Chen-Northern, Inc.
1610 "B" Street
P.O. Box 4699
Helena, Montana 59604

January 9, 1990

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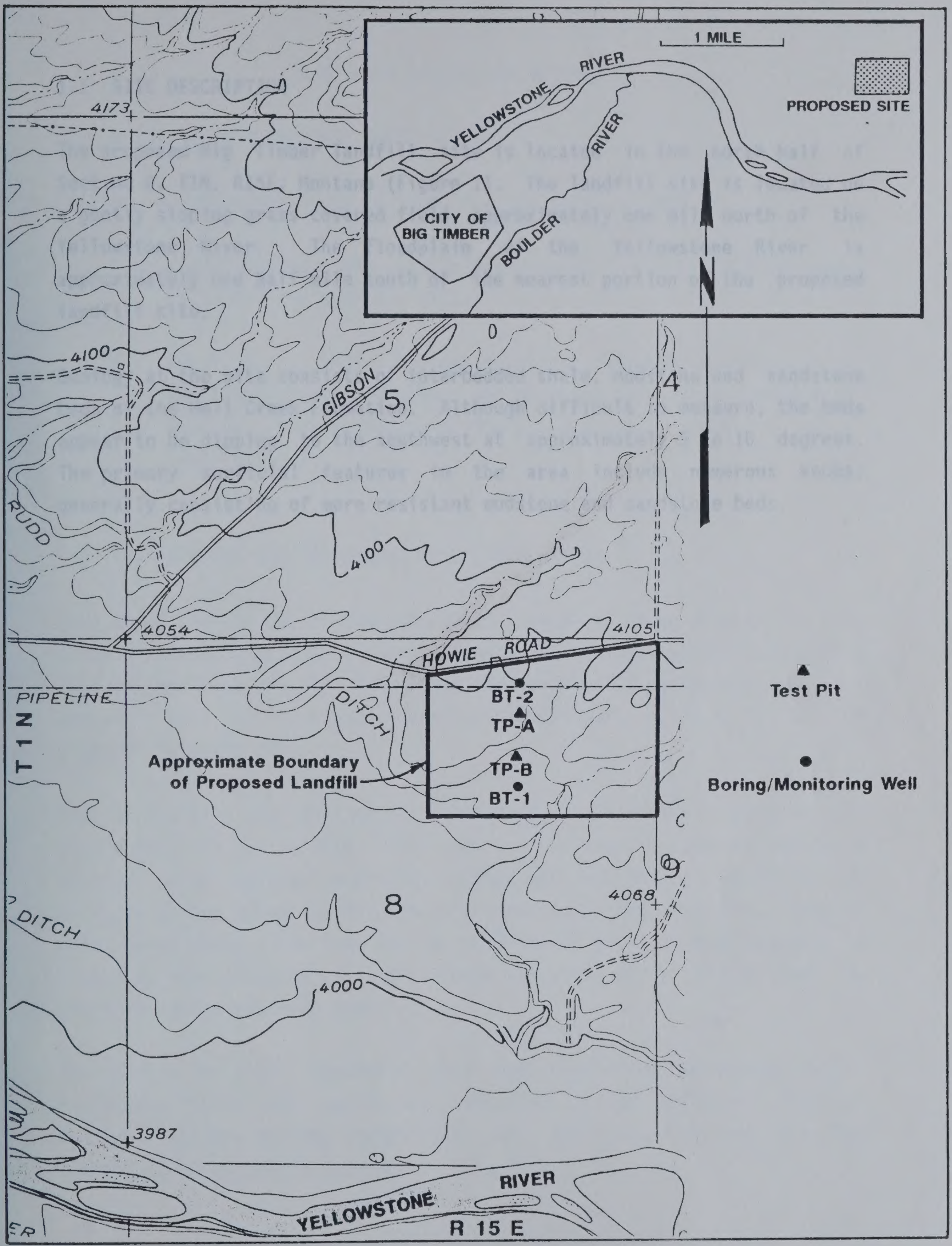
1.0 INTRODUCTION

A hydrogeologic investigation was conducted at a proposed landfill site located approximately three miles northeast of the town of Big Timber, Montana to collect information on groundwater and subsurface lithologic conditions at the site. Figure 1 shows the location of the potential landfill site. Such lithologic and hydrogeologic information is necessary to address new landfill regulations (Subtitle D) proposed by the U.S. Environmental Protection Agency (EPA, 1988). During the site investigation, information on site geology and groundwater characteristics was collected. In addition, lithologic and groundwater data from water supply wells completed in the vicinity of the landfill were collected and reviewed.

Four borings were drilled at the proposed landfill site to obtain site specific lithologic samples and groundwater information. One boring (BT-1) was completed as a dual completion monitoring well in two different water-bearing units encountered. The other three borings were completed as single completion monitoring wells in water-bearing zones encountered in the borings. Bailer recovery tests were performed on both the shallow and deep water-bearing zones encountered in BT-1 to provide an indication of the permeability of the monitored zones. Data resulting from these activities were used to evaluate the quantity and rate of groundwater movement beneath the proposed landfill site.

Three test pits were also excavated at the potential landfill site. Material samples collected from the pits were submitted to a soils laboratory for determination of permeability, grain size, and Atterberg limits. A double ring infiltrometer test was performed in one of the test pits to determine the in situ vertical permeability of the material at the base of the potential landfill.


1 MILE
YELLOWSTONE RIVER
PROPOSED SITE
RIVER
BOULDER
CITY OF BIG TIMBER
N
4173
4100
GIBSON
5
4
0
RUDD
4100
4054
4105
HOWIE ROAD
PIPELINE
DITCH
BT-2
TP-A
TP-B
BT-1
T 1 N
Approximate Boundary of Proposed Landfill
Test Pit
Boring/Monitoring Well
9
4068
8
DITCH
4000
3987
RIVER
YELLOWSTONE
R 15 E
ER

Proposed Big Timber Landfill Site

FIGURE 1

1.1 SITE DESCRIPTION

The proposed Big Timber landfill site is located in the north half of Section 8, T1N, R15E, Montana (Figure 1). The landfill site is located on a gently sloping grass covered field, approximately one mile north of the Yellowstone River. The floodplain of the Yellowstone River is approximately one half mile south of the nearest portion of the proposed landfill site.

Geology at the site consists of interbedded shale, mudstone and sandstone beds of the Hell Creek Formation. Although difficult to measure, the beds appear to be dipping to the southwest at approximately 5 to 10 degrees. The primary surficial features in the area include numerous knobs, generally consisting of more resistant mudstone and sandstone beds.

2.0 DATA COLLECTION ACTIVITIES

2.1 EXISTING HYDROGEOLOGIC INFORMATION

Existing hydrogeologic data reviewed for the site included:

1. Lithologic logs and static water level information from water wells drilled near the site.

2. Groff, S. L., 1962. Reconnaissance Ground-water Studies, Wheatland, Eastern Meagher, and Northern Sweet Grass Counties, Montana. Montana Bureau of Mines and Geology, Special Publication 24.

2.2 TEST BORINGS AND MONITORING WELL INSTALLATION

Four test borings (BT-1 through BT-4, Figure 2) were drilled at the proposed landfill site to document lithologic characteristics in the area. Test borings BT-2 and BT-4 were sited topographically upgradient and BT-1 and BT-3 were sited topographically downgradient (Figure 2) of the proposed landfill area.

Test boring BT-1 was drilled to a total depth of 80 feet using an air rotary drilling rig in July, 1989. Seven inch steel casing was set to a depth of nine feet below ground surface and sealed with bentonite to maintain boring integrity in the upper unconsolidated material. Samples were logged every five feet during drilling of BT-1 or when changes in lithology were observed. A split-spoon was attempted at 28 feet, but no material sample was recovered.

Test boring BT-1 was completed as a dual completion monitoring well. Perforated 2-inch PVC casing was installed at two different vertical intervals in the boring; a bentonite seal was placed between the two identified water-bearing zones.

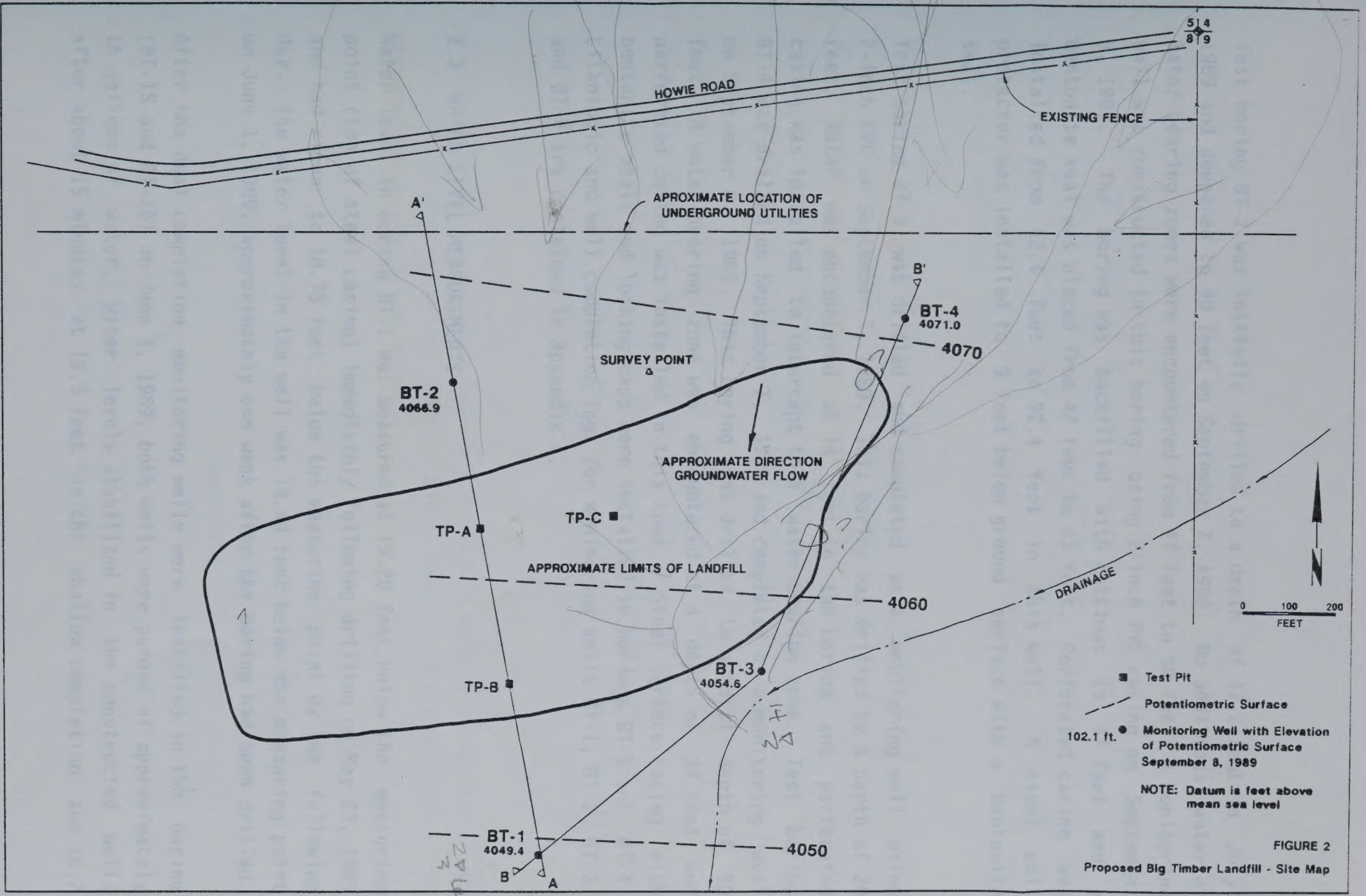

5|4
8|9
HOWIE ROAD
EXISTING FENCE
A'
APROXIMATE LOCATION OF UNDERGROUND UTILITIES
B'
BT-4
4071.0
4070
SURVEY POINT
BT-2
4066.9
APPROXIMATE DIRECTION GROUNDWATER FLOW
TP-A
TP-C
APPROXIMATE LIMITS OF LANDFILL
4060
DRAINAGE
0
100
200
FEET
BT-3
4054.6
14∇
BT-1
4049.4
4050
B
A
2∇ Levels
19∇
Test Pit
Potentiometric Surface
102.1 ft.
Monitoring Well with Elevation of Potentiometric Surface September 8, 1989
NOTE: Datum is feet above mean sea level

FIGURE 2

Proposed Big Timber Landfill - Site Map

Test boring BT-2 was initially drilled to a depth of 47.2 feet in July, 1989 and deepened to 90 feet on September 7, 1989. No additional water or water-bearing zones were encountered from 47 feet to 90 feet; a monitoring well was constructed in this boring using 2-inch PVC casing on September 8, 1989. The boring was backfilled with cuttings to 47 feet and a bentonite seal was placed from 47 feet to 43 feet. Perforated casing was installed from 42.4 feet to 32.4 feet in this well. A steel well protector was installed to 9 feet below ground surface with a bentonite seal.

Test boring BT-3 was drilled and completed as a monitoring well using 2-inch PVC on September 7, 1989. This boring was drilled to a depth of 20 feet. Water was encountered at 14 feet in the boring and perforated casing was installed to intercept this water-bearing zone. Test boring BT-4 was drilled on September 7, 1989 and completed as a monitoring well on September 8, 1989. This boring was drilled to a total depth of 50 feet. A water-bearing zone was encountered at a depth of 34 feet and perforated casing was installed in this zone. Steel surface casing with bentonite seals and locking caps were installed in borings BT-3 and BT-4. Lithologic and well completion logs for monitoring wells BT-1, BT-2, BT-3, and BT-4 are contained in Appendix A.

2.3 WATER LEVEL MEASUREMENTS

Water level in boring BT-1 was measured at 19.20 feet below the measuring point (top of steel casing) immediately following drilling on May 23, 1989 and had risen to 18.75 feet below the measuring point by the following day. The water level in the well was 18.40 feet below the measuring point on June 1, 1989, approximately one week after the boring had been drilled.

After the dual completion monitoring wells were installed in the boring (BT-1S and BT-1D) on June 1, 1989, both wells were purged of approximately 15 gallons of water. Water levels stabilized in the constructed wells after about 15 minutes at 18.5 feet in the shallow completion and 18.7

feet in the deep completion. These measurements indicate a slight downward hydraulic gradient was occurring at this well location in June, 1989.

Water level measurements obtained from the dual completion well on September 7,1989 were 18.42 feet in the shallow completion (BT-1S) and 18.36 feet in the deep completion (BT-1D). These measurements indicate that a slight upward gradient between these two permeable zones was present in September, 1989.

The water level in test boring BT-2 was 46.62 feet below the measuring point immediately after drilling was completed on May 23, 1989 and was 29.2 feet the following day. The water level had risen to 23.38 feet below the measuring point by June 1, 1989. By September 7, 1989 the water level had fallen slightly to 23.64 feet below the measuring point.

Static water level in monitoring well BT-3 was measured at 14.81 feet below the measuring point after drilling on September 7, 1989 and stabilized at 14.67 feet below the measuring point on September 8, 1989. Static water level in BT-4 was at 32.4 feet below the measuring point after drilling on September 7, 1989 and was at 16.62 feet on September 8, 1989.

An elevation survey was performed at the site to determine the elevation of the well measuring points and the potentiometric surface. Results of this survey are presented in Table 1.

TABLE 1

Location	SWL (Ft. Below M.P.)	Elevation (feet above mean sea level) measuring point	Elevation (feet above mean sea level) potentiometric surface 9/8/89
BT-1S	18.42	4067.78	4049.4
BT-1D	18.36	4067.78	4049.4
BT-2	23.64	4090.55	4066.9
BT-3	14.67	4069.31	4054.6
BT-4	16.62	4087.64	4071.0

2.4 BAILER RECOVERY TESTS

Following installation of monitoring wells in test boring BT-1, a bailer recovery aquifer test was conducted on both well completions. The goal of this test was to gain an understanding of the permeability of the water-bearing zones encountered beneath the proposed landfill site. After bailing approximately five gallons of water from each well, the rise of water in each well was measured with an electric well probe. Permeability calculations of acquired data were performed using the Bouwer and Rice method (Bouwer and Rice, 1976; Bouwer, 1989) and a method described in U.S Navy (1974). Results are presented in section 3.2.

check calcs

2.5 TEST PITS AND SOIL SAMPLES

Three test pits (TP-A, TP-B and TP-C) were excavated within the proposed landfill site boundaries to a depth of approximately 13 feet. Figure 2 shows the locations of the test pits. Material samples were collected from the bottom of TP-A and TP-B. Grain size, Atterberg limits, and permeability tests were performed on the collected samples by Chen-Northern's soil testing laboratories in Billings and Helena.

An in situ double ring permeability test was performed at a depth of 13 feet in test pit TP-C. Material encountered at the bottom of this test pit was a reddish clay/shale similar to material encountered in Test Pits A and B.

3.0 DATA ANALYSIS

3.1 GROUNDWATER OCCURRENCE

Review of available geologic reports and well log data indicate that the principal groundwater-bearing units in the vicinity of the proposed landfill are alluvium of the Yellowstone River and thin sandstone and mudstone beds in the Hell Creek Formation. The Yellowstone River alluvium is a highly productive aquifer and yields good quality water (Groff, 1962). The Hell Creek formation yields water from sandstone beds to springs and wells at numerous locations on both sides of the Yellowstone River (Groff, 1962).

Well logs were obtained for six domestic wells located 0.5 to 1.5 miles northwest of the proposed landfill site. Information on the well logs indicate wells range in depth from 46 to 140 feet and yield from 10 to 22 gallons per minute (gpm). These domestic wells are located where the Hell Creek Formation outcrops at the surface and are likely completed in the Hell Creek Formation. Static water levels range from 16 to 40 feet below ground surface. Four domestic wells located 1.0 to 1.5 miles to the east of the proposed landfill site range from 65 to 233 feet deep and yield from 0 to 40 gpm, according to well logs. These wells are also likely completed in the Hell Creek Formation.

Artesian groundwater is present in a minimum of two water-bearing zones beneath the proposed landfill site. These units are confined above and below by clay/shale aquitards. The upper water-bearing zone was encountered at a depth of 27 to 38 feet in BT-1 and is comprised of interbedded sandstone and shale beds. The lower water-bearing zone in BT-1 was encountered from 60 to 66 feet and is predominantly sandstone with some minor shale. The water-bearing zone encountered in boring BT-2 was not as distinct, but likely a brown mudstone unit encountered at 42 feet in the boring is the source of artesian water encountered. Stratigraphy encountered in the test borings confirm that the site is situated on the Hell Creek Formation.

A water-bearing sandstone and mudstone zone encountered at a depth of 12 to 14 feet in BT-3 does not appear to be under artesian pressure. The static water level stabilized at 13.2 feet below ground surface in this well. A water-bearing zone in Boring BT-4 was encountered at a depth of 34 to 39 feet below ground surface. This zone was under artesian pressure and likely consists of interbedded mudstone and clay/shale beds.

3.2 GROUNDWATER MOVEMENT

The groundwater flow direction and gradient was calculated for the immediate landfill area using static water level data obtained from monitoring wells constructed on-site in conjunction with elevation survey data. Table 1 contains elevation and static water level information. Figure 2 shows the potentiometric surface as determined from the static water level information.

Based on the survey data and static water levels in the monitoring wells, the flow direction of groundwater beneath the proposed landfill site is to the southwest. The hydraulic gradient in this direction is approximately 0.02 ft/ft. The horizontal permeability of the water-bearing sandstone beds encountered in test boring BT-1 was calculated using data from the bailer recovery test. Two methods were used to calculate permeability including: 1) the U.S. Navy method (1974) and (2) the Bouwer and Rice method (1976). These methods yielded calculated permeabilities ranging from 1.1×10^{-4} to 3.0×10^{-4} cm/sec.

The average linear velocity for groundwater at the proposed landfill site was calculated using the above permeabilities in conjunction with the equation:

$$v = \frac{K\,i}{n}$$

where: v = velocity (cm/sec)
K = permeability (cm/sec)
i = gradient
n = porosity

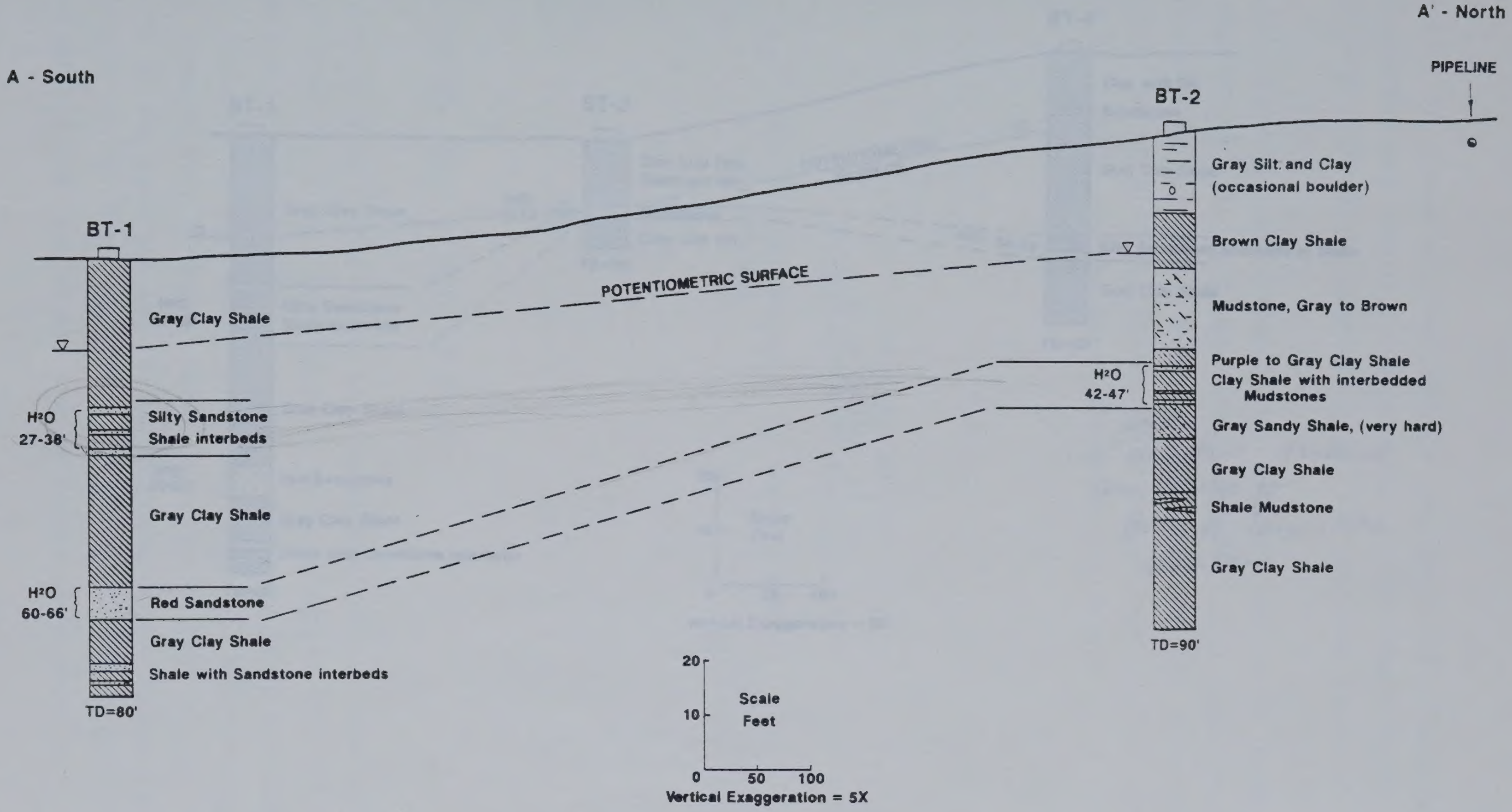
The porosity of sandstones and mudstones have been determined by numerous investigators. Davis and DeWiest (1970) report porosity values for sandstone ranging from 15 percent to 25 percent. Freeze and Cherry (1979) provide a range of 5 to 30 percent for sandstone, and Todd (1980) gives representative porosity values of sandstone of 33 to 37 percent. Sandstone described in Davis and DeWiest (1970) are similar to sandstone aquifers at the proposed landfill site. A porosity of 20 percent is considered a reasonable estimate of the porosity of the sandstone aquifers encountered at the site and was used to calculate groundwater velocities at the site.

Groundwater velocities calculated from these inputs ranged from 0.95 cm/day to 2.6 cm/day. An average of these two values, or approximately 1.8 cm/day, may be representative of the average linear velocity of groundwater at the site.

These calculated permeabilities and velocities indicate that the subsurface materials underlying the potential landfill site are not conducive to significant groundwater movement.

Figures 3 and 4 are geologic cross-sections of the potential landfill site. The water-bearing zones encountered in the test borings are indicated as well as the level of the potentiometric head. As these diagrams show, the artesian pressure that is present in the more permeable water-bearing strata is confined by the relatively impermeable strata above and below these water-bearing zones.

Water-bearing zones encountered beneath the proposed landfill site consist of relatively thin (0.5-3.0 feet thick) sandstone and mudstone units interbedded with clay and clay/shale beds. No correlations between water-bearing zones encountered in each boring at the potential landfill site were made due to the variable nature of the strata encountered. However, comparison of specific conductivity (SC) values for the water from each water-bearing zone may provide some indication of the

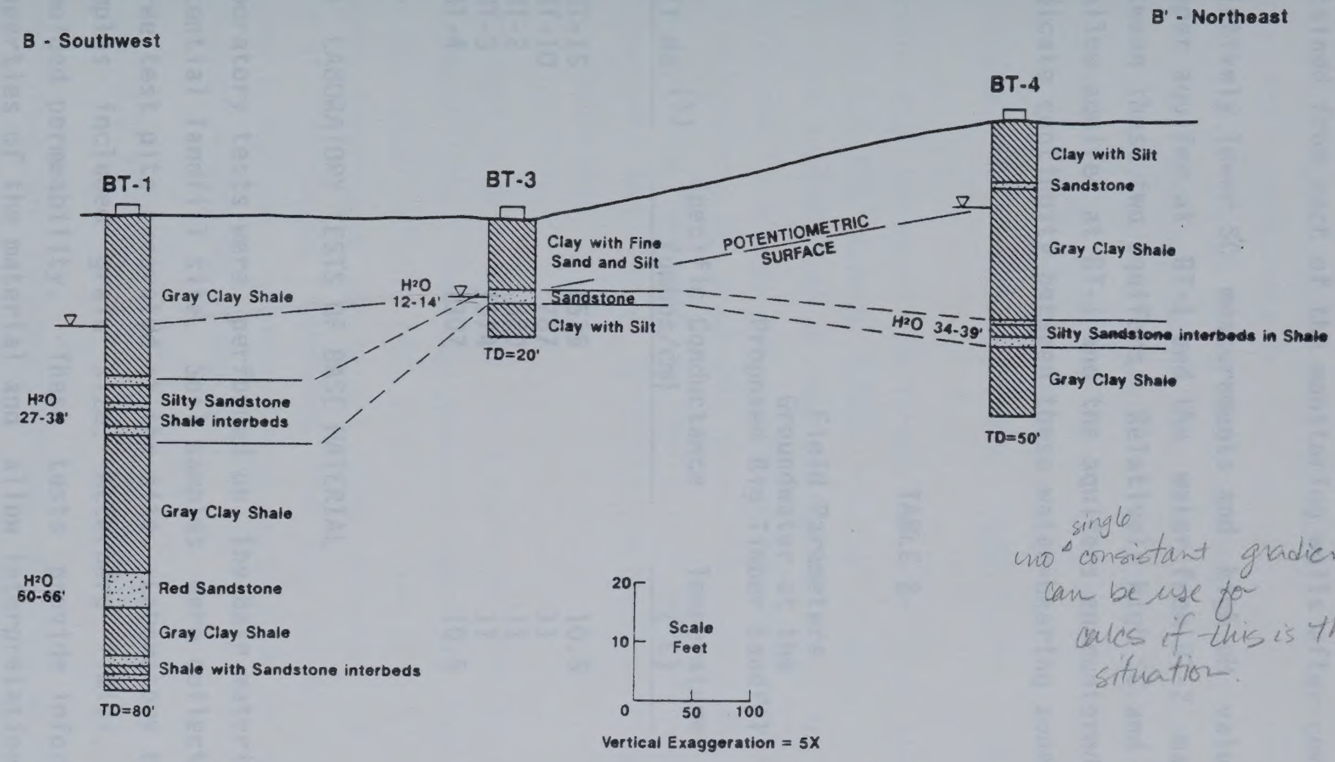

A' - North
A - South
PIPELINE
BT-2
BT-1
Gray Silt and Clay
(occasional boulder)
Brown Clay Shale
POTENTIOMETRIC SURFACE
Mudstone, Gray to Brown
Gray Clay Shale
Purple to Gray Clay Shale
H²O
42-47'
Clay Shale with interbedded
Mudstones
H²O
27-38'
Silty Sandstone
Shale interbeds
Gray Sandy Shale, (very hard)
Gray Clay Shale
Shale Mudstone
Gray Clay Shale
Gray Clay Shale
H²O
60-66'
Red Sandstone
Gray Clay Shale
TD=90'
Shale with Sandstone interbeds
TD=80'
20
10
0
Scale
Feet
50
100
Vertical Exaggeration = 5X

NOTE: All water bearing zones under artesian pressure

See FIGURE 2 for location of sections.

FIGURE 3

Proposed Big Timber Landfill - Geologic Cross Section
A - A'


B - Southwest
B' - Northeast
BT-1
BT-3
BT-4
Gray Clay Shale
H^2O 12-14'
Silty Sandstone
Shale interbeds
H^2O 27-38'
Gray Clay Shale
H^2O 60-66'
Red Sandstone
Gray Clay Shale
Shale with Sandstone interbeds
TD=80'
Clay with Fine Sand and Silt
Sandstone
Clay with Silt
TD=20'
POTENTIOMETRIC SURFACE
Clay with Silt
Sandstone
Gray Clay Shale
H^2O 34-39'
Silty Sandstone interbeds in Shale
Gray Clay Shale
TD=50'
20
10
0
Scale Feet
50
100
Vertical Exaggeration = 5X

no single consistant gradient can be use for calcs if this is the situation.

See FIGURE 2 for location of sections.

FIGURE 4

Proposed Big Timber Landfill - Geologic Cross Section
B - B'

distribution of groundwater occurrence at the site. Table 2 presents specific conductance values, temperature, and pH measurements for water obtained from each of the monitoring wells after completion.

Relatively lower SC measurements and high pH values in water from the deeper aquifer at BT-1 and the water from BT-2 may indicate continuity between these two aquifers. Relatively high SC and low pH values for the shallow aquifer at BT-1 and the aquifers encountered in BT-3 and BT-4 may indicate continuity between these water-bearing zones.

TABLE 2

Field Parameters
Groundwater at the
Proposed Big Timber Landfill

Well No.(1)	Specific Conductance (umhos/cm)	Temperature (°C)	pH (std. units)
BT-1S	1525	10.5	8.5
BT-1D	787	11	9.7
BT-2	580	11	9.1
BT-3	1574	11	7.7
BT-4	1307	10.5	8.1

3.3 LABORATORY TESTS OF BASE MATERIAL

Laboratory tests were performed on the base material obtained from the potential landfill site. Soil samples were collected from the bottom of three test pits excavated at the site. Laboratory tests performed on the samples included grain size, Atterberg limits, moisture/density and remolded permeability. These tests provide information on the basic properties of the material and allow interpretations of how the material will perform as a base material. Atterberg limit, grain-size, and permeability testing data sheets are contained in Appendix B.

The material is classified in accordance with ASTM D2487, as a low plastic lean clay (CL). Grain size analysis of the material indicates that the material is approximately 30 percent clay, 62 percent silt, and 8 percent sand. The liquid limit is 31 and the plastic limit is 15, yielding a plastic index of 16. The high percentages of silt and clay in the material and medium plastic index indicate that this material would be a good base material for a landfill. General estimates of the permeability of silt and clay based on these soil properties range from 1 x 10^{-3} cm/sec to 1 x 10^{-7} cm/sec for silt and from 1 x 10^{-6} cm/sec to 1 x 10^{-9} cm/sec for clay (Freeze and Cherry, 1979; Fetter, 1980; Todd, 1980).

Permeability testing was performed on a material sample from Test Pit A remolded to 95% maximum laboratory dry density, as determined by ASTM D698. The permeability of the remolded material was 3 x 10^{-7} cm/sec. This permeability is likely the minimum permeability which would be possible for the material in a natural state. If the material was excavated and compacted as a liner for the landfill, a permeability in this range could be expected. This value is within the general ranges expected for this type of material.

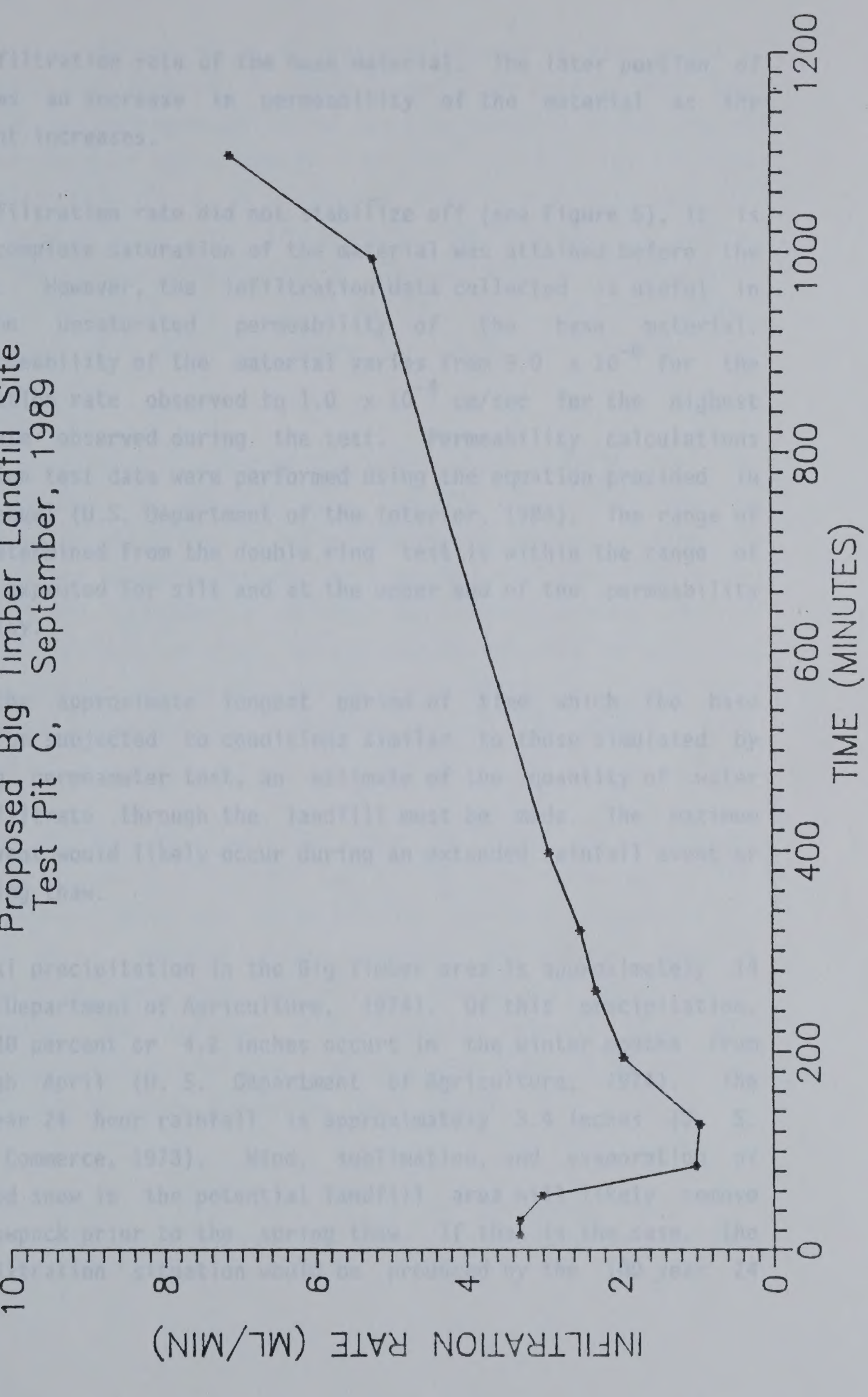
The laboratory permeability test verifies that this material exhibits a low permeability. The laboratory permeability test was performed on a remolded sample of the base material, and this lab permeability may be somewhat lower than the actual field permeability. However the plastic limit of the sample indicated that any cracks or openings which may develop in the soil profile during desiccation of the soil would likely close upon re-wetting of the soil.

3.4 IN SITU PERMEABILITY TESTING OF BASE MATERIAL

A double ring infiltration test was performed on material present at a depth of 13 feet in test pit TP-C. Figure 5 is a plot of the infiltration rate vs time for this test. The graph shows an initial decrease in infiltration rate. This part of the curve represents the initial

FIGURE 5 — INFILTRATION RATE VS. TIME

Double Ring Permeability Test
Proposed Big Timber Landfill Site
Test Pit C, September, 1989



unsaturated infiltration rate of the base material. The later portion of the curve shows an increase in permeability of the material as the moisture content increases.

Because the infiltration rate did not stabilize off (see Figure 5), it is unlikely that complete saturation of the material was attained before the test was ended. However, the infiltration data collected is useful in calculating the unsaturated permeability of the base material. Unsaturated permeability of the material varies from 9.0 x 10^{-6} for the lowest infiltration rate observed to 1.0 x 10^{-4} cm/sec for the highest infiltration rate observed during the test. Permeability calculations from infiltration test data were performed using the equation provided in the Drainage Manual (U.S. Department of the Interior, 1984). The range of permeability determined from the double ring test is within the range of permeabilities expected for silt and at the upper end of the permeability expected for clay.

To determine the approximate longest period of time which the base material could be subjected to conditions similar to those simulated by the double ring permeameter test, an estimate of the quantity of water which would infiltrate through the landfill must be made. The maximum infiltration event would likely occur during an extended rainfall event or during the spring thaw.

The total annual precipitation in the Big Timber area is approximately 14 inches (U. S. Department of Agriculture, 1974). Of this precipitation, approximately 30 percent or 4.2 inches occurs in the winter months from November through April (U. S. Department of Agriculture, 1974). The maximum 100 year 24 hour rainfall is approximately 3.4 inches (U. S. Department of Commerce, 1973). Wind, sublimation, and evaporation of partially melted snow in the potential landfill area will likely remove much of the snowpack prior to the spring thaw. If that is the case, the worst case infiltration situation would be produced by the 100 year 24 rainfall event.

If it is assumed that 100 percent of the maximum 100 year 24 hour rainfall (3.4 inches) infiltrates through the landfill and is in contact with the base material, the maximum permeability of the base material at the end of the wetting front would be approximately 1.0×10^{-4} cm/sec. This is the maximum permeability determined by the double ring permeability test in which the total head of water infiltrated during the test was 3.5 inches in 18.2 hours. The average permeability of the base material during this infiltration event would be 4.1×10^{-5} cm/sec. This is the average permeability of the base material during the 18.2 hour double ring permeameter test.

This scenario is considered to represent a worst case situation for the landfill. The material at the base of a landfill will likely not be flooded with extensive quantities of water causing complete saturation of the base material over extended periods of time, but will more likely be subjected to periodic episodes of wetting and drying fronts passing through the soil. Because of this, most leachate movement through the soil will be controlled by an unsaturated permeability less than the maximum unsaturated permeability recorded during the double ring infiltration test.

The permeability of the base material after 18 hours of continuous saturation was calculated at 1.0×10^{-4} cm/sec. This is approximately the same permeability value which was calculated for aquifers encountered in monitoring well BT-1. Because these aquifers are under artesian conditions, confining beds both above and below must have lower permeabilities than the aquifer. This would indicate that the permeability of the base material must decrease with depth to be able to contain the artesian pressure present in these aquifers.

4.0 SUMMARY

A hydrogeologic investigation of the proposed Big Timber landfill site was performed. Tasks completed included: a review of available geologic and hydrogeologic information for the site; installation of one dual completion monitoring well and three single completion monitoring wells; aquifer tests; and excavation and testing of materials from three test pits. Monitoring wells installed during this investigation allowed for the determination of the groundwater flow direction and gradient beneath the landfill site. Subsurface material encountered in the monitoring well borings included alternating beds of clay, silt, shale, mudstone, and sandstone belonging to the Hell Creek Formation.

Water-bearing sandstone and mudstone beds are under artesian pressure and exhibited relatively low hydraulic conductivities ranging from 1.1×10^{-4} cm/sec. to 3×10^{-4} cm/sec. The hydraulic gradient at the site is approximately 0.02 ft/ft to the southwest. Average flow velocity of groundwater in the aquifers is estimated at 1.8 cm/day.

Laboratory tests on material collected at the base of the proposed landfill site indicate that the base material has a high clay and silt content and exhibits a relatively low permeability of 3.0×10^{-7} when remolded to 95 percent of the maximum laboratory dry density as determined by ASTM D698. An in situ permeability test on the base material indicates that the base material would have an unsaturated permeability similar to the water-bearing sandstone beds after 18 hours of saturation. This situation likely represents the worst case infiltration situation for the landfill. Because of an artesian pressure head of approximately 11 feet in sandstone aquifers beneath the site, clay/shale aquitards with lower permeabilities must be present above and below these aquifers. This indicates that the base material likely becomes less permeable with depth.

Prepared by:

David Hazen

David Hazen, P.G.
Hydrologist

Reviewed by:

Myles J. Grotbo

Myles Grotbo
Senior Hydrologist

Jeremiah B. Bowser

Jeremiah Bowser, P.E.
Division Manager

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APPENDIX A

LITHOLOGIC AND WELL COMPLETION LOGS OF BORE HOLES

Chen-Northern, Inc.

WELL COMPLETION LOG

State: Montana County: Sweetgrass Project: Big Timber Landfill Hole Name or Number: BT-1 shallow & deep

Legal Location: T 1N R 15E Sec 8 Tract ABDD Descriptive Location: 400′ west of draw, downgradient of proposed L.F.

Recorded By: D. Hazen Hole Started: Time: 1045 Date: 05/23/89 Hole Completed: Time: 1545 Date: 05/23/89 Driller: Rock Creek Drilling, Bill Kupfner

Drill Method: Rotary Drilling Fluids Used: Air Pilot Hole Diameter: 8″ to 9′ Drilled Hole Diameter: 6″

Total Depth Drilled: 80′ Total Depth Reamed: _____ Total Depth Cased Below G.S.: _____ Diameter and Type of Casing: 2″ PVC

Weight or Gage of Casing: Sch 40 Interval Perforated or Screened Below G.S.: 35.5-25.5 68.5-58.5 Target Aquifer: Fox Hills Formation Packer Type and Depth Below G.S.: N/A

DURING INSTALLATION WAS:	YES	NO
Well Developed?	x	
Well Test Pumped?		x
Water Samples Taken?		x
Material Samples Taken?	x	
E-Logs?		x

Method Perforated or Screened

- _____ No casing in hole
- _____ Open bottom
- _____ Slotted with Mill's Knife
- _____ Slotted with a torch
- _____ Screened by pulling casing
- _____ Field saw cut
- x Mechanical slots 0.030 (size)
- _____ Other (specify) _____

Static Fluid Level Below Measuring Point:	Date/Time Measured:
18.40	06/01/89 @ 0850
18.75	05/24/89 @ 0839
19.27′	05/23/89 @ 1734

Measuring Point Description/Elevation: Top of steel well protector, +2.82 ft. MP Height Above (+/-) or Below G.S.: +2.82′

Well Annulus Completion Description: Dual Completion: 80′-72′, cuttings; 72-71.5′, Wyo-Ben bentonite; 71.5′-56.6′, 10-20 Colorado Silica Sand; 56.6′-38′, Wyo-Ben Bentonite (medium); 38′-22′, 10-20 Colorado Silica Sand; 22′-11′, Wyo-Ben Bentonite (medium)

Well Development Description: Bailed 15 gallons from both the shallow and deep wells; performed bailer Recovery Test on each well.

Remarks: 7″ steel surface casing installed to 9 ft. below ground surface. Volclay bentonite pellets placed from 9′ to 8′ BGS outside of 7″ steel and 8′ to 1′ backfilled with clay/shale cuttings, concrete surface seal installed around steel surface casing. Ground surface at BT-1 assumed elevation of 0.0 ft.

Chen-Northern, Inc.

DRILLING AND LITHOLOGIC LOG

BT-1

(Depth Below G.S.)

From	To	DRILLING LOG Geological, Drilling, and Water Conditions and Sampling
0	1′	Topsoil/organic material
1′	27′	Gray clay/shale, friable, minor silt and sand, dry minor organics
27′	28′	Silty sandstone, minor water <0.5 gpm, dark red. No recovery with split spoon sampler.
28′	38′	Sandstone and shale interbedded - dark red - making approximately 2 gallons per minute
38′	60′	Gray shale, dry - sealing off water in upper zone (27 to 38′)
60′	66′	Red sandstone with some shale - making 5-6 gpm
66′	74′	Gray shale
74′	80′	Shale with some red sand interbeds, still making 5-6 gpm

TD = 80′

Chen-Northern, Inc.

WELL COMPLETION LOG

State: Montana County: Sweetgrass Project: Big Timber Landfill Hole Name or Number: BT-2

Legal Location: T 1N R 15E Sec 8 Tract ABAD Descriptive Location: 100' west of TP-10, 100' NE of TP-1, upgradient

Recorded By: D. Hazen Hole Started: Time: 1600 Date: 05/23/89 Hole Completed: Time: 1710 Date: 05/23/89 Driller: Rock Creek, Kupfner

Drill Method: Rotary Drilling Fluids Used: Air/Water Pilot Hole Diameter: 8" to 9' Drilled Hole Diameter: 6" to 47', 4-7/8" 47'-90'

Total Depth Drilled: 90' Total Depth Reamed: --- Total Depth Cased Below G.S.: 42.4' Diameter and Type of Casing: 2" PVC

Weight or Gage of Casing: Sch. 40 Interval Perforated or Screened Below G.S.: 32.4-42.4 Target Aquifer: Sandstone lenses Packer Type and Depth Below G.S.: N/A

DURING INSTALLATION WAS:	YES	NO
Well Developed?		x
Well Test Pumped?		x
Water Samples Taken?	x	
Material Samples Taken?	x	
E-Logs?		x

Method Perforated or Screened

	No casing in hole
	Open bottom
	Slotted with Mill's Knife
	Slotted with a torch
	Screened by pulling casing
	Field saw cut
x	Mechanical slots 0.010 (size)
	Other (specify)

Static Fluid Level Below Measuring Point:	Date/Time Measured:
23.64	09/07/89 @ 1130
23.38	06/01/89 @ 1330
29.20	05/24/89 @ 0830
46.62	05/23/89 @ 1713

Measuring Point Description/Elevation: Top of steel well protector, 125.6 ft. MP Height Above (+/-) or Below G.S.: +2.7'

Well Annulus Completion Description: 90 - 47', cuttings; 47' - 43', Bentonite chips; 43' - 30', 10-20 Colorado Silica Sand; 30' - 16', Volplug Bentonite chips

Well Development Description: 9/8/89 - bailed approximately 25 gallons

Remarks: 7" steel surface casing installed to 9' BGS with bentonite seal. Measuring Point Elevation determined by level survey; Datum (0.0') is ground surface at well BT-1, well deepened from 47.2' to 90' on 9/7/89

SC = 580, T = 11 C, pH = 9.1

Chen-Northern, Inc.

DRILLING AND LITHOLOGIC LOG

BT-2

(Depth Below G.S.)

From	To	DRILLING LOG Geological, Drilling, and Water Conditions and Sampling
0	15′	Overburden, gray silt with clay, ocassional boulder, slightly moist
15′	21′	Brown to light brown shale, friable, dry
21′	25′	Brown shale, friable, dry
25′	40′	Light gray to brown mudstone, dry
40′	42′	Light purple to gray, clay/shale, slightly moist
42′	47.2	Light gray to brown mudstone, slightly moist
47.2′	55′	Gray sandy shale, very hard drilling, several soft intervals
55′	65′	Gray clay shale, friable, easier drilling, let well recover at 59 ft. for 10 minutes, slight amount of water, no noticeable increase from 47′
65′	70′	Shale/mudstone, dark gray, hard drilling
70′	79′	Clay/shale, soft., slight amount of water, no noticeable increase from 47′, hard drilling 76′ - 77′ and 78′ - 78.5′
79′	90′	Clay shale/mudstone, gray and gray brown, let sit at 90′ - very slight amount of water, no noticeable increase from 47′

Chen-Northern, Inc.

WELL COMPLETION LOG

State: Montana County: Sweetgrass Project: Big Timber Landfill Hole Name or Number: BT-3

Legal Location: T 1N R 15E Sec 8 Tract AACD Descriptive Location: 230' SE of Test Pit 12, 30' N of draw at S edge of site

Recorded By: D. Hazen Hole Started: Time: 1440 Date: 09/07/89 Hole Completed: Time: 1600 Date: 09/07/89 Driller: Rock Creek, Kupfner

Drill Method: Rotary Drilling Fluids Used: Air/Water Pilot Hole Diameter: 8" Reamed Hole Diameter: 4 3/4"

Total Depth Drilled: 21' Total Depth Reamed: ____ Total Depth Cased Below G.S.: 20.7' Diameter and Type of Casing: 2" PVC

Weight or Gage of Casing: Sch. 40 Interval Perforated or Screened Below G.S.: 7.7 - 17.7 Target Aquifer: Alluvial Packer Type and Depth Below G.S.: N/A

DURING INSTALLATION WAS:	YES	NO
Well Developed?		
Well Test Pumped?		
Water Samples Taken?	x	
Material Samples Taken?	x	
E-Logs?		

Method Perforated or Screened	
	No casing in hole
	Open bottom
	Slotted with Mill's Knife
	Slotted with a torch
	Screened by pulling casing
	Field saw cut
x	Mechanical slots 0.010 (size)
	Other (specify)

Static Fluid Level Below Measuring Point: 14.67' / 14.81' Date/Time Measured: 09/08/89 @ 1145 - after overnight stablization / 09/07/89 @ 1618

Measuring Point Description/Elevation: Top of steel surface casing MP Height Above (+/-) or Below G.S.: +1.5'

Well Annulus Completion Description: 20.7 - 7.0', 10-20 Colorado Silica Sand; 7.0 - 5.5, volplug bentonite chips.

Well Development Description: Bailed approximately 20 gallons - would not go dry

Remarks: 11.5' 7" steel surface casing installed to 9.5', sealed with Volplug bentonite 1/4" pellets

SC = 1574, T = 11 C

PH = 7.9 @ 11 C

Chen-Northern, Inc.

DRILLING AND LITHOLOGIC LOG

BT-3

(Depth Below G.S.)

From	To	DRILLING LOG Geological, Drilling, and Water Conditions and Sampling
0	1'	Topsoil
1'	3'	Sand with silt, brown
3'	12'	Clay with minor fine sand and silt, slightly moist, dark brown, firm
12'	14'	Sand/gravel - possible sandstone lense, wet
14'	17'	Clay with silt and firm sand, brown
17'	20'	Clay, minor silt, slightly moist
		Making approximately 2 gpm at 20'
		TD - 20'

Chen-Northern, Inc.

WELL COMPLETION LOG

State: Montana County: Sweetgrass Project: Big Timber Landfill Hole Name or Number: BT-4

Legal Location: T 1N R 15E Sec 8 Tract AACA Descriptive Location: Northwest of landfill site in small draw

Recorded By: D. Hazen Hole Started: Time: 1600 Date: 09/07/89 Hole Completed: Time: 1715 Date: 06/07/89 Driller: Rock Creek, Kupfner

Drill Method: Rotary Drilling Fluids Used: Air Pilot Hole Diameter: 8" Reamed Hole Diameter: 4-3/4"

Total Depth Drilled: 50' Total Depth Reamed: ______ Total Depth Cased Below G.S.: 43.2' Diameter and Type of Casing: 2" PVC

Weight or Gage of Casing: Sch. 40 Interval Perforated or Screened Below G.S.: 38.2 - 28.2 Target Aquifer: Mudstone Beds Packer Type and Depth Below G.S.: N/A

DURING INSTALLATION WAS:	YES	NO
Well Developed?		
Well Test Pumped?		
Water Samples Taken?	x	
Material Samples Taken?	x	
E-Logs?		

	Method Perforated or Screened
	No casing in hole
	Open bottom
	Slotted with Mill's Knife
	Slotted with a torch
	Screened by pulling casing
	Field saw cut
x	Mechanical slots 0.010 (size)
	Other (specify)

Static Fluid Level Below Measuring Point: 16.62' 32.40' Date/Time Measured: 09/08/89 @ 900 09/07/89 @ 1921

Measuring Point Description/Elevation: Top of steel surface casing MP Height Above (+/-) or Below G.S.: +2.0'

Well Annulus Completion Description: 50' - 41', caved material; 41' - 23', 10-20 Colorado Silica Sand; 23' - 8' Volplug medium chips Bentonite

Well Development Description: Bailed approximately 20 gallons - let recover

SWL = 38.6' after bailing dry

29.5 1056 approximately 5 minutes later

Remarks: 11.5' surface casing installed with bentonite chip seal.

pH = 8.1 , T = 10.5 C

SC = 1307

DRILLING AND LITHOLOGIC LOG

BT-4

(Depth Below G.S.)

From	To	DRILLING LOG Geological, Drilling, and Water Conditions and Sampling
0	2'	Silty sand, brown
2'	10'	Clay with minor silt, dark gray brown
10'	10.5'	Hard sandstone
10.5'	20'	Clay/shale - dry - slightly moist, gray brown
20'	34'	Clay - very hard; dry and dusty, light gray, hard
34'	39'	Slightly moist, clay with mudstone clasts.
39'	41'	Clay, brown, very moist No standing water @ 40' - wet cuttings
41'	50'	Clay, light gray, hard, dry and dusty

(Water on drill steel - 16' off bottom)

TD - 50'

APPENDIX B

LABORATORY TEST RESULTS

hen-Northern, Inc.

A member of the HIH group of companies

600 SOUTH 25TH STREET
P. O. BOX 30615
BILLINGS, MT 59107
(406) 248-9161
FAX (406) 248-9282

TECHNICAL REPORT

REPORT TO:

CHEN-NORTHERN, INC.
ATTN: MR. DAVE HAZEN
P O BOX 4699
HELENA, MT 59601

DATE: June 20, 1989
JOB NUMBER: 87-598
SHEET: 1 OF 4
INVOICE NO.: 78891

REPORT OF: Laboratory Testing - Big Timber (189-3019)

Sample Identification:

On June 6, 1989, we received two soil samples from the subject project. Your instructions were to perform sieve and hydrometer analysis, moisture content determinations, moisture-density relationship and a remolded triaxial permeability test.

The triaxial permeability test specimens were remolded to 95 percent of the maximum dry density and optimum moisture content determined from the moisture-density determination. The tests were performed in general accordance with ASTM or other approved procedures. The test procedures are summarized below.

Test	Standard
Particle Size Analysis	ASTM D422
Moisture Content	ASTM D2216
Moisture-Density Determination	ASTM D698
Triaxial Permeability	Corps of Engineers Manual EM 110-2-1906 Appendix VII

The test results are included on the attached plates. If you have any questions regarding this report or if we can be of further service, please contact us.

Reviewed by

kg

AS A MUTUAL PROTECTION TO CLIENTS, THE PUBLIC AND OURSELVES, ALL REPORTS ARE SUBMITTED AS THE CONFIDENTIAL PROPERTY OF OUR CLIENTS AND AUTHORIZATION FOR PUBLICATION OF STATEMENTS, CONCLUSIONS OR EXTRACTS FROM OR REGARDING OUR REPORTS IS RESERVED PENDING OUR WRITTEN APPROVAL. SAMPLES WILL BE DISPOSED OF AFTER TESTING IS COMPLETED UNLESS OTHER ARRANGEMENTS ARE AGREED TO IN WRITING.

Chen-Northern, Inc.

GRAIN SIZE DISTRIBUTION CURVE

Project: Big Timber

Location: TP-A

Classification

Moisture Content 11 %

Sample No.

Job No. 87-598

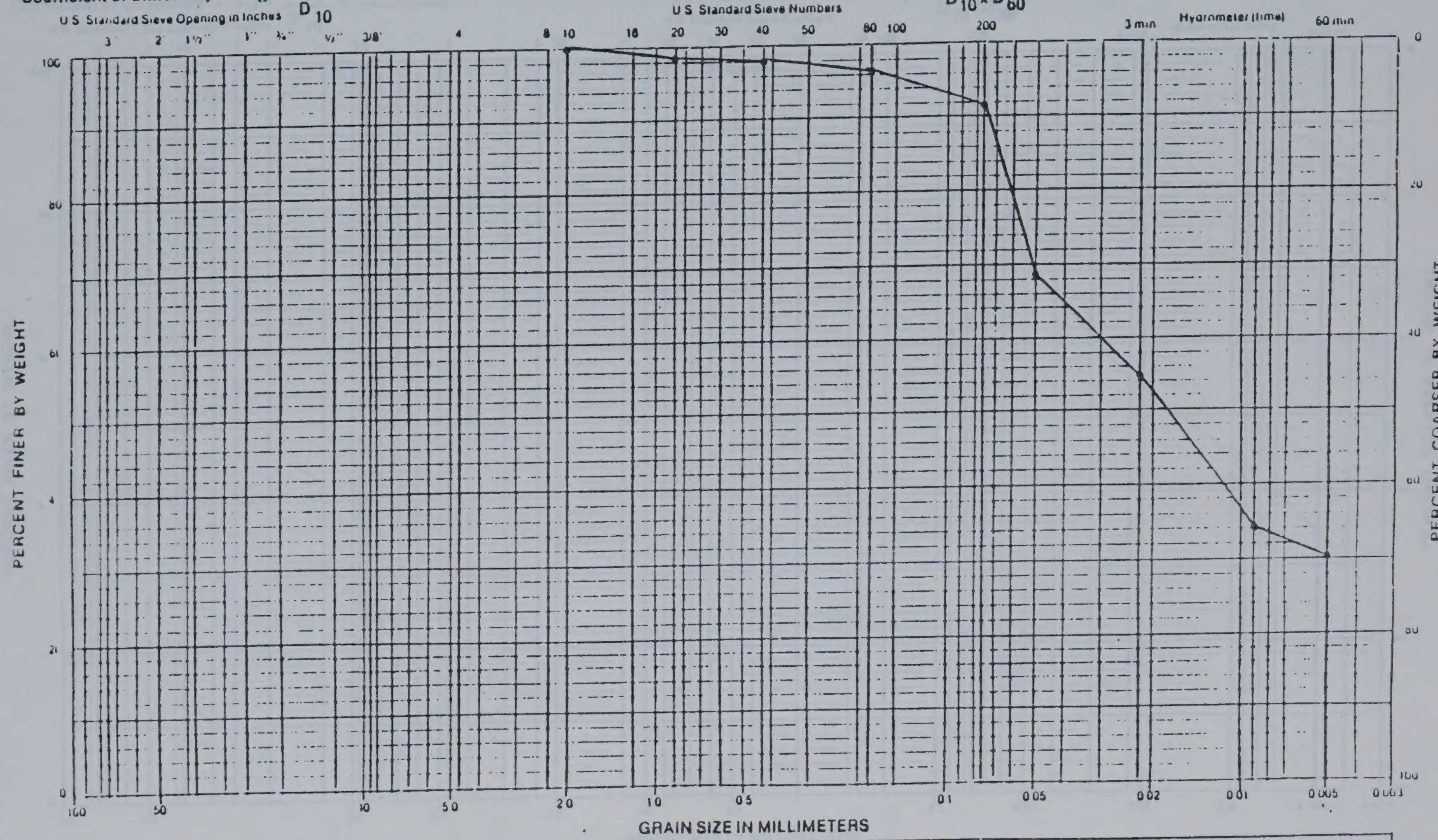
Date June 20, 1989

Liquid Limit - %

Plasticity Index - %

Coefficient of Uniformity $= C_U = \frac{D_{60}}{D_{10}} =$ N/A

Coefficient of Curvature $= C_Z = \frac{(D_{30})^2}{D_{10} \times D_{60}} =$ N/A



Gravel		Sand			Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay

(Rev 1/88) CNI 105

Chen-Northern, Inc.

GRAIN SIZE DISTRIBUTION CURVE

Project: Big Timber

Location: TP-B

Classification

Moisture Content 12 %

Sample No.

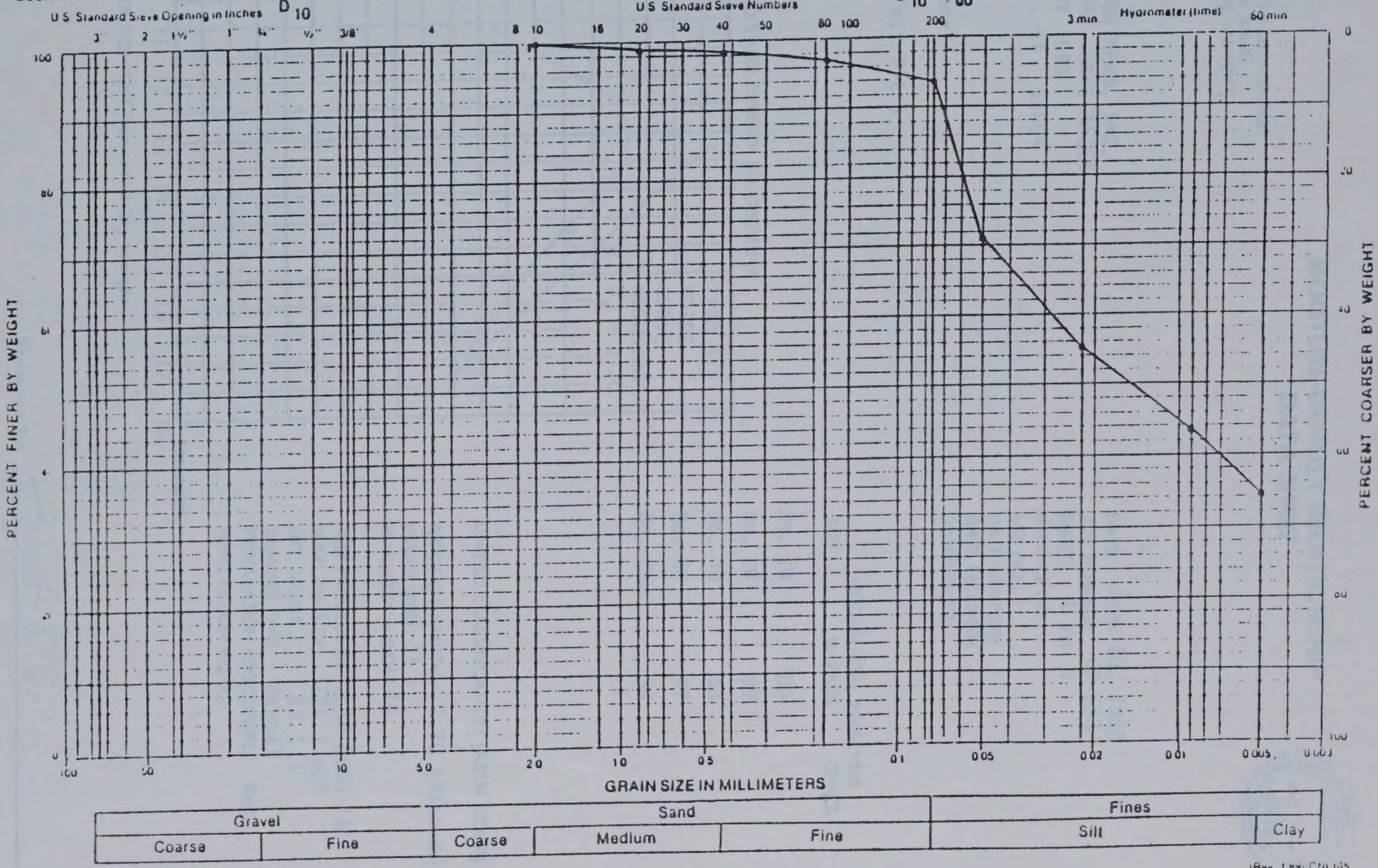
Job No. 87-598

Date June 20, 1989

COEFFICIENT OF PERMEABILITY 3×10^{-7} cm/sec

Coefficient of Uniformity $= C_U = \frac{D_{60}}{D_{10}} =$ N/A

Coefficient of Curvature $= C_Z = \frac{(D_{30})^2}{D_{10} \times D_{60}} =$ N/A



(Rev 1.89) CNI 105

Northern
Engineering
and Testing, Inc

600 SOUTH 25TH STREET
P. O. BOX 30615
BILLINGS, MT 59107

MOISTURE-DENSITY RELATIONSHIP
DATA SHEET

REPORT TO: CHEN-NORTHERN, INC.
ATTN: MR. DAVE HAZEN
P O BOX 4699
HELENA, MT 59604

DATE: June 20, 1989
JOB NUMBER: 87-598
SHEET: 1 OF 1
INVOICE NO.:
LAB NO.:
DATE SAMPLED:
DATE RECEIVED:
SAMPLED BY:

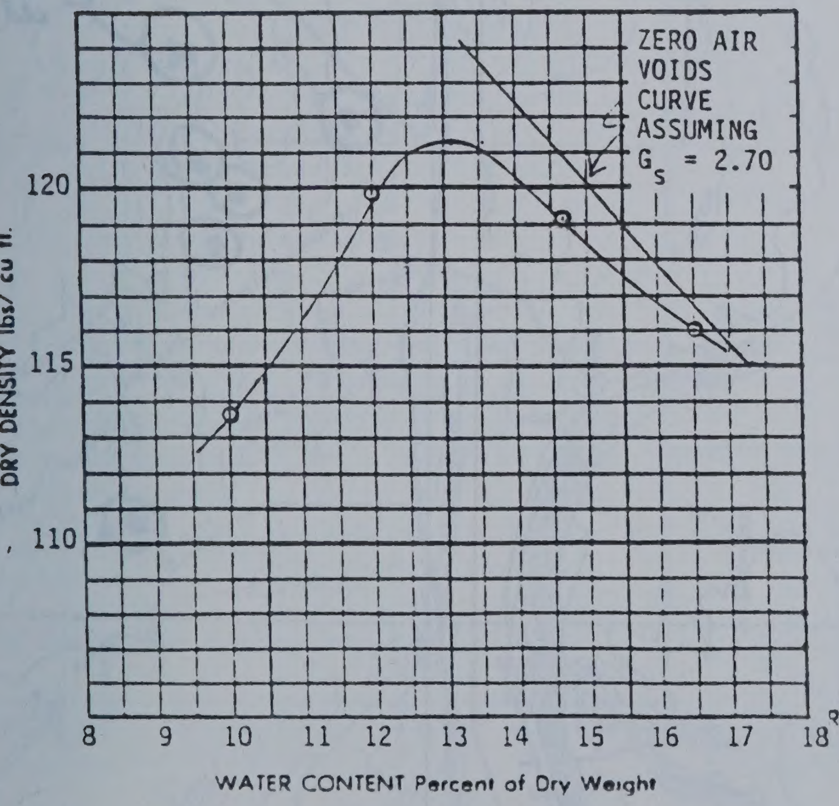
PROJECT: Big Timber
CONTRACTOR:
SAMPLE LOCATION: Test Pit B

MATERIAL USE:

MECHANICAL ANALYSIS

SIZE	% PASS	SPECS.
No. 10	100	
No. 20	99	
No. 40	98	
No. 80	97	
No. 200	94	

MOISTURE-DENSITY RELATIONSHIP



UNIFIED CLASSIFICATION (ASTM D2487)

SPECIFIC GRAVITY: 2.70 (Assumed)
LIQUID LIMIT: 31
PLASTICITY INDEX: 16

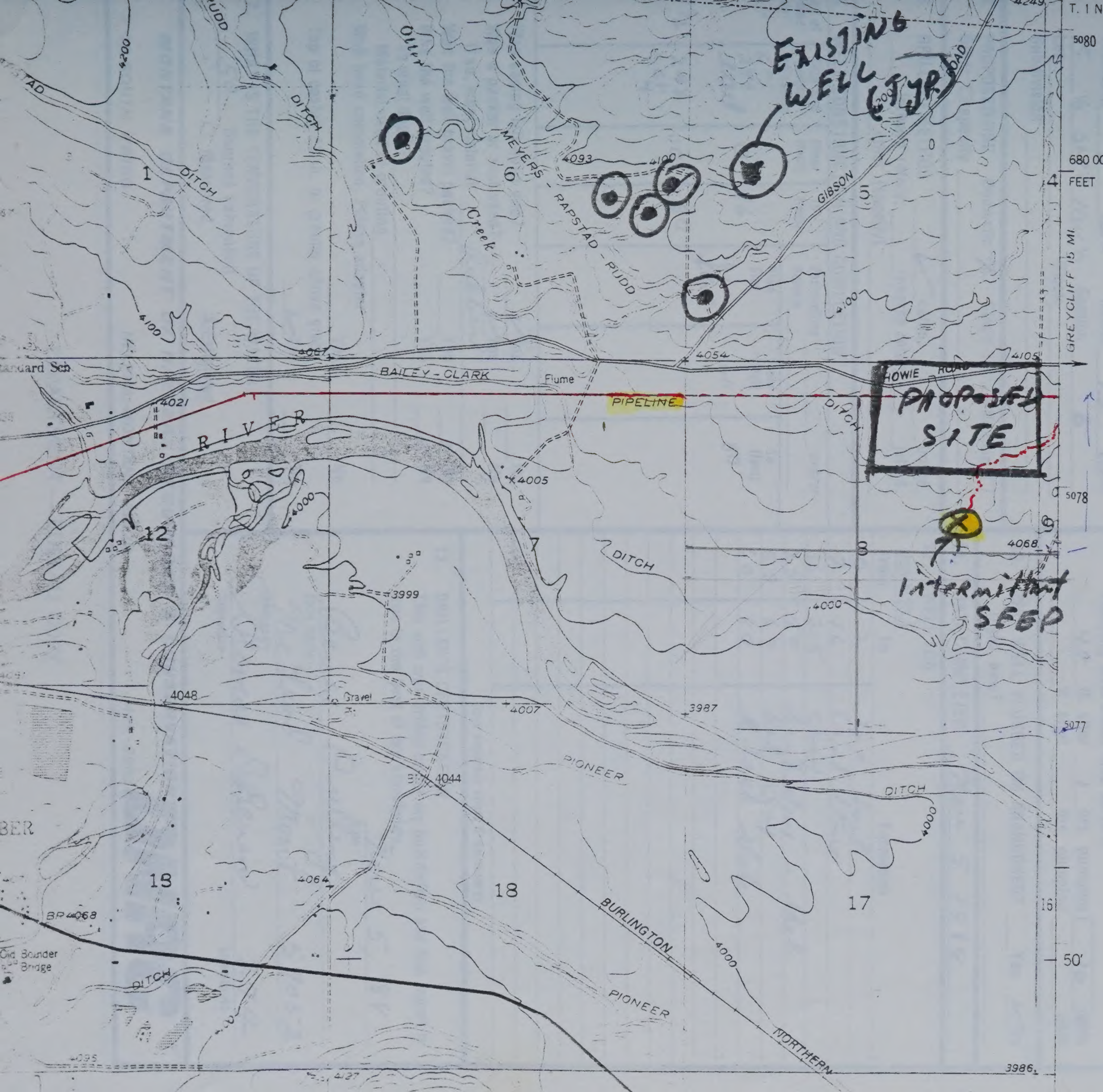
TEST PROCEDURE ASTM D698 'A'
MAX. DENSITY: 121.3 pcf
OPT. MOIST.: 13.1 %
RAMMER TYPE: · Manual
PREPARATION PROCEDURE: Wet
PENETRATION RESIS.:

REMARKS:

DISTRIBUTION:

Reviewed By:

AS A MUTUAL PROTECTION TO CLIENTS, THE PUBLIC AND OURSELVES, ALL REPORTS ARE SUBMITTED AS THE CONFIDENTIAL PROPERTY OF OUR CLIENTS, AND AUTHORIZATION FOR PUBLICATION OF STATEMENTS, CONCLUSIONS OR EXTRACTS FROM OR REGARDING OUR REPORTS IS RESERVED PENDING OUR WRITTEN APPROVAL. SAMPLES WILL BE DISPOSED OF AFTER TESTING IS COMPLETED UNLESS OTHER ARRANGEMENTS ARE AGREED TO IN WRITING.


EXISTING WELL
PROPOSED SITE
Intermittent SEEP
PIPELINE
HOWIE ROAD
BAILEY - CLARK
Flume
GIBSON ROAD
MEYERS - RAPSTAD - RUDD
Otter Creek
RIVER
DITCH
PIONEER
BURLINGTON NORTHERN
Gravel
Standard Sch
Old Bounder Bridge
GREYCLIFF 15 MI
680 000 FEET
T. 1 N.
5080
5078
5077
50'
1
5
6
7
8
9
12
16
17
18
4
4105
4054
4067
4021
4093
4100
4200
4005
4000
3999
3987
4007
4048
4044
4064
4068
BP 4068
4095
4127
3986
880/1760

LOCATION OF EXISTING WELLS WITHIN ONE MILE OF SITE

BILLINGS

Form No. 603 R9/82

097 01N 15E 05BC

File No. Sweetgrass

①

WELL LOG REPORT

State law requires that this form be filed by the water well driller within 60 days after comple'

026790

1. WELL OWNER
Name Jerry Wilson

2. CURRENT MAILING ADDRESS
Box 358
Bigtimber Montana 59011

3. WELL LOCATION
County Sweetgrass
Township 1 [✓ N] S Range 15 [✓ E] W
S ½ SW¼ NW¼ Section 5
Lot Block
Subdivision

4. PROPOSED USE Domestic ☒ Stock ☐ Irrigation ☐
Other ☐ specify

5. DRILLING METHOD ✓ cable, ____ bored, ____ forward rotary, ____ reverse rotary, ____ jetted, ____ other (specify)

6. WELL CONSTRUCTION AND COMPLETION

ize of rilled ole	Size and weight of casing	From (feet)	To (feet)	Perforations ____ and/or Screen ____ Kind Size	From (feet)	To (feet)
6"	6" 280 steel	0	16	1/8 slot	60	80
4½	248 SCH 4	10	80			

Was casing left open end? ✓ Yes ____ No
Was a packer or seal used? ✓ Yes ____ No
If so, what material Rubber
Was the well gravel packed? ____ Yes ✓ No
Was the well grouted? ____ Yes ✓ No
To what depth?
Material used in grouting
Well head completion: Pitless adapter ____ Yes ____ No
Top of casing 12 in. or greater above grade ✓ Yes ____ No

7. WHAT IS THE TEMPERATURE OF THE WATER?
50 Degrees Fahrenheit
☐ Measured ☒ Estimated

8. WATER LEVEL
Static water level 16 feet below land surface
If flowing; closed-in pressure ____ psi
____ gpm
Controlled by: ____ valve, ____ reducers, ____ other, (specify)

9. WELL TEST DATA ✓ pump ____ bailer ____ other, (specify)
Pumping level below land surface:
40 ft. after 1 hrs. pumping 10 gpm
____ ft. after ____ hrs. pumping ____ gpm

10. WAS WELL PLUGGED OR ABANDONED? ____ Yes ✓ No
If yes, how?

11. DATE COMPLETED Nov 5 1984

12. WELL LOG

Depth (ft.) From	To	Formation
0	2	top soil
2	16	sand stone
16	25	clay
25	50	sand stone - shale
50	60	Red clay
60	80	Black shale

(use separate sheet if necessary)

13. DRILLER'S CERTIFICATION
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.
Nov 5, 84
Date
Beven Drilling
Firm Name
McLeod Mont 59052
Address
Thomas D Beven 294
Signature License No.

MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION DNRC

32 SOUTH EWING HELENA, MONTANA 59620 449-3962

DEPARTMENT — BUREAU COPY

BILLINGS

Form No. 603 R9/82

097 01N 15E 06DAA

File No. Sweetgrass ②

WELL LOG REPORT

State law requires that this form be filed by the water well driller within 60 days after completi

026792

1. WELL OWNER
Name Rick Schuler

2. CURRENT MAILING ADDRESS
Box 166 A
Melville Rt Bigtimber mt 59011

3. WELL LOCATION
County Sweetgrass
Township 1 [✓ N]/S Range 15 [✓ E]/W
NE ¼ NE ¼ SE ¼ Section 6
Lot 1 Block
Subdivision

4. PROPOSED USE Domestic ☑ Stock ☐ Irrigation ☐
Other ☐ specify

5. DRILLING METHOD ✓ cable, ___ bored,
___ forward rotary, ___ reverse rotary, ___ jetted,
___ other (specify)

6. WELL CONSTRUCTION AND COMPLETION

Size of drilled hole	Size and weight of casing	From (feet)	To (feet)	Perforations ✓ and/or Screen: Kind Size	From (feet)	To (feet)
6"	280 steel	0	30	1/2 9 hole	70	80
	4 1/2 Plastic	8	80			

Was casing left open end? ✓ Yes ___ No
Was a packer or seal used? ✓ Yes ___ No
If so, what material Rubber
Was the well gravel packed? ___ Yes ✓ No
Was the well grouted? ___ Yes ✓ No
To what depth?
Material used in grouting
Well head completion: Pitless adapter
___ Yes ___ No
Top of casing 12 in. or greater above grade
✓ Yes ___ No

7. WHAT IS THE TEMPERATURE OF THE WATER?
54 Degrees Fahrenheit
☐ Measured ☒ Estimated

8. WATER LEVEL
Static water level 40 feet below land surface
If flowing; closed-in pressure ___ psi
___ gpm
Controlled by: ___ valve, ___ reducers,
___ other, (specify)

9. WELL TEST DATA ✓ pump ___ bailer
___ other, (specify)
Pumping level below land surface:
9 ft. after 1 hrs. pumping 10 gpm
___ ft. after ___ hrs. pumping ___ gpm

10. WAS WELL PLUGGED OR ABANDONED? ___ Yes ✓ No
If yes, how?

11. DATE COMPLETED 30 July 84

12. WELL LOG

Depth (ft.) From	To	Formation
0	6	Top soil
6	8	Sand Stone
8	40	Clay
40	80	Clay & Sandstone

(use separate sheet if necessary)

RECEIVED
AUG 9 1984
DEPT. OF NATURAL RESOURCES AND CONSERVATION
BILLINGS OFFICE

13. DRILLER'S CERTIFICATION
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.

Aug 8
Date

Beeven Drilling
Firm Name

McLeod Mont 59052
Address

Thomas D Beeven 294
Signature License No.

MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION **DNRC**

32 SOUTH EWING HELENA, MONTANA 59620 449-3962

DEPARTMENT — BUREAU COPY

Form No. 603 R9/82

BILLINGS

File No. ______ ③

WELL LOG REPORT

State law requires that this form be filed by the water well driller within 60 days after completic

026793

1. WELL OWNER
Name Cliff Cuneo

2. CURRENT MAILING ADDRESS
307 West 3rd
Bigtimber Mont

3. WELL LOCATION
County Sweet Grass
Township 1 [✓ N]/S Range 15 [✓ E]/W
SE ½ SE ¼ SE ¼ Section 6
Lot ______ Block ______
Subdivision ______

4. PROPOSED USE Domestic ☒ Stock ☐ Irrigation ☐
Other ☐ specify ______

5. DRILLING METHOD ✓ cable, ______ bored, ______ forward rotary, ______ reverse rotary, ______ jetted, ______ other (specify) ______

6. WELL CONSTRUCTION AND COMPLETION

Size of drilled hole	Size and weight of casing	From (feet)	To (feet)
6"	6" 280 steel	0	22
	4½ plastic	15	60

Perforations ½" hole and/or Screen ______

Kind Size	From (feet)	To (feet)
½ hole	50	60

Was casing left open end? ✓ Yes ______ No
Was a packer or seal used? ✓ Yes ______ No
If so, what material Rubber
Was the well gravel packed? ______ Yes ✓ No
Was the well grouted? ✓ Yes ______ No
To what depth? Below Pitless
Material used in grouting Cement
Well head completion: Pitless adapter ✓ Yes ______ No
Top of casing 12 in. or greater above grade ✓ Yes ______ No

7. WHAT IS THE TEMPERATURE OF THE WATER?
54 Degrees Fahrenheit
☐ Measured ☒ Estimated

8. WATER LEVEL
Static water level 40 feet below land surface
If flowing; closed-in pressure ______ psi
______ gpm
Controlled by: ______ valve, ______ reducers, ______ other, (specify) ______

9. WELL TEST DATA ✓ pump ______ bailer ______ other, (specify) ______
Pumping level below land surface:
9 ft. after 1 hrs. pumping 18 gpm
______ ft. after ______ hrs. pumping ______ gpm

10. WAS WELL PLUGGED OR ABANDONED? ______ Yes ✓ No
If yes, how? ______

11. DATE COMPLETED July 24 84

12. WELL LOG

Depth (ft.) From	To	Formation
0	35	clay
35	60	Clay - Sandstone

RECEIVED
AUG 9 1984
DEPT. OF NATURAL RESOURCES AND CONSERVATION BILLINGS OFFICE

(use separate sheet if necessary)

13. DRILLER'S CERTIFICATION
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.
~~July~~ aug 8 84
Date
Beven Drilling
Firm Name
McLeod Mont 59052
Address
Thomas O Beven 294
Signature License No.

MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION **DNRC**

32 SOUTH EWING HELENA, MONTANA 59620 449-3962

DEPARTMENT — BUREAU COPY

(4)

GW 2 097 01N 15E 10DA

File No. 84909

DUPLICATE

LOG

Sweet Grass
OCT 6 1965
Montana Bureau of
Mines and Geology

Approved Stock Form—State Publishing Co., Helena, Montana—42329

① 09 T. 1 N R. 15 E 10 DA

County Sweet Grass

STATE OF MONTANA
ADMINISTRATOR OF GROUNDWATER CODE
OFFICE OF STATE ENGINEER

Notice of Completion of Groundwater Appropriation by Means of Well

DEVELOPED AFTER JANUARY 1, 1962

(Under Chapter 237, Montana Session Laws, 1961)

Top of Ground

11 ft Dark Gray Shale

(Elev. above sea level.............)

7 ft Brown Sand Rock

8 ft Red Rock

water bearing

14 ft Gray Rock & Shale

65 ft Bottom of Hole

Show exact depth of bottom.

Owner W. A. Hulin Address Big Timber, Mont

Driller Albert Heck Address Harlowton Mont

Date of Notice of appropriation of groundwater Oct 5 1965

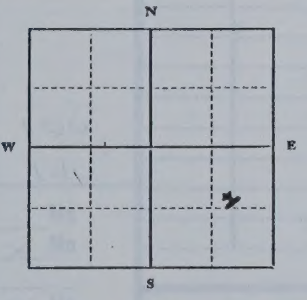
Date well started 9/24 Date completed 9/29

Type of well Drilled Equipment used Cable Tool
(Dug, Driven, bored or drilled) (Churn drill, rotary or other)

Water use: Domestic ☐ Municipal ☐ Stock ☒ Irrigation ☐
Industrial ☐ Drainage ☐ Other ☐

Indicate on the diagram the character and thickness of the different strata met with in drilling, such as soil, clay, shale, gravel, rock or sand, etc. Show depth at which water is encountered, thickness and character of water-bearing strata and height to which the water rises in the well.

Size of Drilled Hole	Size and Weight of Casing	From (Feet)	To (Feet)	PERFORATIONS Kind Size	From (Feet)	To (Feet)
8"	6" U.S.W. 22 lb ft	0	65	Holes 1/4"	30	65



¼ Sec. 10 T. 1 N R. 15 E
Indicate location of well and place of use, if possible. Each small square represents 40 acres.

Static Water Level for non-flowing well 37 feet.

Shut-in Pressure for Flowing Well..........

Pumping Water Level 60 feet at 30 gal. per minute.

Discharge in gal. per min. of flowing well..........

How Tested Baler

Length of Test 3 Hours

Remarks: (Gravel packing, cementing, packers, type of shutoff)..........

(Continue on reverse side)

USE—If used for irrigation, industrial, drainage or other. Explain, state number of acres and location or other data (i.e.: Lot, Block and Addition).

114
Driller's License Number

Albert Heck
Driller's Signature

This form to be prepared by driller, and three copies to be filed by the owner with the County Clerk and Recorder in the county in which the well is located, tissue copy to be retained by driller.

Please answer all questions. If not applicable, so state, otherwise the form will be returned.

RECEIVED

JUL 10 1984

MONT. DEPT. of NATURAL RESOURCES & CONSERVATION

m No. 603 R8/83

LLINGS

097 01N 15E 06DD

File No. Sweetgrass

(5)

WELL LOG REPORT

State law requires that this form be filed by the water well driller within 60 days after completio

026794

WELL OWNER
Name Gary Harkness

CURRENT MAILING ADDRESS
P.O. Box 1182
Big Timber, MT. 59011

WELL LOCATION
County Sweetgrass
Township 1 [✓ N]/S Range 15 [✓ E]/W
W ½ SE ¼ SE ¼ Section 6
Lot ______ Block ______
Subdivision ______

PROPOSED USE Domestic ☒ Stock ☐ Irrigation ☐
Other ☐ specify ______

DRILLING METHOD ______ cable, ______ bored,
X forward rotary, ______ reverse rotary, ______ jetted,
______ other (specify) ______

WELL CONSTRUCTION AND COMPLETION

Size and weight of casing	From (feet)	To (feet)	Perforations and/or Screen: Kind Size	From (feet)	To (feet)
6 5/8 .250	0	20'			
2 1/2" 160" PVC	10'	140'	5/8 holes	80 130'	100' 140'

Was casing left open end? X Yes ______ No
Was a packer or seal used? ______ Yes X No
If so, what material ______
Was the well gravel packed? ______ Yes X No
Was the well grouted? ______ Yes X No
To what depth? ______
Material used in grouting ______
Well head completion: Pitless adapter
______ Yes ______ No
Top of casing 12 in. or greater above grade
X Yes ______ No

WHAT IS THE TEMPERATURE OF THE WATER?
______ Degrees Fahrenheit
☐ Measured ☐ Estimated

8. WATER LEVEL
Static water level 35' feet below land surface
If flowing; closed-in pressure ______ psi
______ gpm
Controlled by: ______ valve, ______ reducers,
______ other, (specify) ______

9. WELL TEST DATA ______ pump ______ bailer
X other, (specify) Air
Pumping water level below land surface:
140 ft. after 2 hrs. pumping 10 gpm
______ ft. after ______ hrs. pumping ______ gpm

10. WAS WELL PLUGGED OR ABANDONED? ______ Yes X No
If yes, how? ______

11. DATE COMPLETED May 4 - 1984

12. WELL LOG

Depth (ft.) From	To	Formation
0	10	Topsoil + Clay
10	25	Red Clay + Shale
25	140	Hard Shale + Clay
	100'	
	140	

(use separate sheet if necessary)

13. DRILLER'S CERTIFICATION
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.

5-4-84
Date

Hillman Drilling
Firm Name

Rt 85 Box 128 Livingston MT 59047
Address

Signature

361
License No.

MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION DNRC

32 SOUTH EWING HELENA, MONTANA 59620 449-3962

ING CO., HELENA, MONT.

DEPARTMENT - BUREAU COPY

(6)

Form No. 603 R10/79 097 IN 15E10 BA Sweetgrass File No.

BILLINGS

WELL LOG REPORT

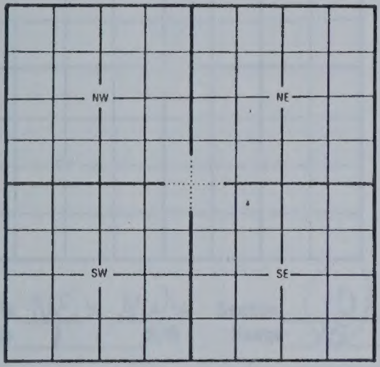
State law requires that this form be filed by the water well driller within 60 days after completi

026795

1. WELL OWNER
Name JAMES PARRENT

2. CURRENT MAILING ADDRESS
Box- 573
Big Timber, Mt. 59011

3. WELL LOCATION



E½ NE ¼ NW ¼ Section 10
Township 1 N/[illegible] Range 15 E/[illegible]
County SWEETGRASS
Lot ______ Block ______
Subdivision ______
Well Elevation ______
Accuracy: ____ ± 10'; ____ ± 50'; ____ ± 100';

4. DRILLING METHOD X cable, ____ bored, ____ forward rotary, ____ reverse rotary, ____ jetted, ____ other (specify) ______

5. WELL CONSTRUCTION AND COMPLETION

Size of drilled hole	Size and weight of casing	From (feet)	To (feet)	Perforations ______ and/or Screen ______ Kind Size	From (feet)	To (feet)
6"	6" 250	0'	23'	NONE		

Was casing left open end? X Yes ____ No
Was a packer or seal used? ____ Yes X No
If so, what material ______
Was the well gravel packed? ____ Yes X No
Was the well grouted? X Yes ____ No
To what depth? 23'
Material used in grouting CLAY
Well head completion: Pitless adapter ______
12 in. above grade ______, other ______
(If other, specify) ______
Pump horsepower ☐, pump type ______
Pump intake level ______ feet below land surface
Power (electric, diesel, etc.) ______

6. WATER LEVEL
Static water level 37 feet below land surface
If flowing, closed-in pressure ______ psi
______ gpm flow through ______ inch pipe
Controlled by: ____ valve, ____ reducers, ____ other
(if other, specify) ______

7. WELL TEST DATA ____ pump ____ bailer ____ other
(if other, specify) ______
Pumping level below land surface:
____ ft. after ____ hrs. pumping ☐ gpm
____ ft. after ____ hrs. pumping ____ gpm

8. WAS WELL PLUGGED OR ABANDONED? X Yes ____ No
If yes, how? Capped - Might drill deeper

9. DATE STARTED 5/25/83
DATE COMPLETED 6/8/83

10. WELL LOG

Depth (ft.)

From	To	Formation
0	2	Top Soil
2	11	SAND
12	65	CLAY - BLUE
65	70	SANDSTONE [illegible]
70	78	CLAY BLUE
78	80	SAND - ¼ GPM
80	127	CLAY - BLUE
127	129	SAND - NO WATER
129	233	CLAY BLUE

RECEIVED
AUG - 9 1983
DEPT. OF NATURAL RESOURCES AND CONSERVATION BILLINGS OFFICE

(use separate sheet if necessary)

11. DRILLER'S CERTIFICATION
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.

6/14/83
Date

Birchell Well Drilling
Firm Name

4580 Bannock Dr. Bozeman
Address

Dennis L Birchell 370
Signature License No.

MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION DNRC
32 SOUTH EWING HELENA, MONTANA 59601 449-3634

DEPARTMENT COPY WL 10022

Form No. 603 R10/79

File No. ______

BILLINGS

WELL LOG REPORT

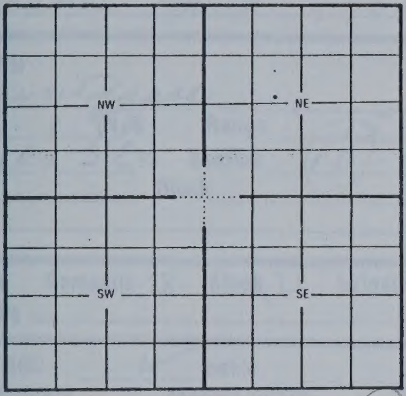
State law requires that this form be filed by the water well driller within 60 days after completi

026796

1. WELL OWNER
Name JAMES PARRENT

2. CURRENT MAILING ADDRESS
Box 573
Big Timber, Mt. 59011

3. WELL LOCATION



E½ NE ¼ NW ¼ Section 10
Township 1 N/S Range 15 E/W
County ______
Lot ______ Block ______
Subdivision ______
Well Elevation ______
Accuracy: ______ ± 10'; ______ ± 50'; ______ ± 100';

4. DRILLING METHOD X cable, ______ bored, ______ forward rotary, ______ reverse rotary, ______ jetted, ______ other (specify) ______

5. WELL CONSTRUCTION AND COMPLETION

Size of drilled hole	Size and weight of casing	From (feet)	To (feet)	Perforations and/or Screen Kind Size	From (feet)	To (feet)
6"	6" 250	0'	10'			

Was casing left open end? X Yes ______ No
Was a packer or seal used? ______ Yes X No
If so, what material ______
Was the well gravel packed? ______ Yes X No
Was the well grouted? X Yes ______ No
To what depth? 10 Ft.
Material used in grouting Clay
Well head completion: Pitless adapter ______
12 in. above grade ______, other ______
(If other, specify) ______
Pump horsepower ☐, pump type ______
Pump intake level ______ feet below land surface
Power (electric, diesel, etc.) ______

6. WATER LEVEL
Static water level 21 feet below land surface
If flowing, closed-in pressure ______ psi
______ gpm flow through ______ inch pipe
Controlled by: ______ valve, ______ reducers, ______ other
(If other, specify) ______

7. WELL TEST DATA ______ pump ______ bailer ______ other
(If other, specify) ______
Pumping level below land surface:
______ ft. after ______ hrs. pumping ☐ gpm
______ ft. after ______ hrs. pumping ______ gpm

8. WAS WELL PLUGGED OR ABANDONED? X Yes ______ No
If yes, how? Capped - May drill Later

9. DATE STARTED 6/8/83
DATE COMPLETED 6/11/83

10. WELL LOG

Depth (ft.) From	To	Formation
0	1	SAND
1	4	SANDSTONE
4	68	CLAY BLUE
68	71	SAND - ¼ GPM
71	100	CLAY BLUE

RECEIVED
AUG - 9 1983
DEPT. OF NATURAL RESOURCES AND CONSERVATION
BILLINGS OFFICE

(use separate sheet if necessary)

11. DRILLER'S CERTIFICATION
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.
Date 6/14/83
Firm Name Birchell Well Drilling
Address 4580 BANNOCK DR. BOZEMAN
Signature Dennis L Birchell
License No. 370

MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION DNRC
32 SOUTH EWING HELENA, MONTANA 59601 449-3634

DEPARTMENT COPY

WL - 10923

097 1N 15E 10 DA Sweetgrass ④

orm No. 603 (R 6-84)

File No.

WELL LOG REPORT

State law requires that this form be filed by the water well driller within 60 days after completic

031284

WELL OWNER
Name Aleta Faust

CURRENT MAILING ADDRESS
PO Box 1338
Big Timber Mont 59011

WELL LOCATION
County Sweetgrass
Township 1 [✓ N] S Range 15 [✓ E] W
1/4 NE1/4 SE1/4 Section 10
Lot Block
Subdivision

PROPOSED USE Domestic ☒ Stock ☐ Irrigation ☐
Other ☐ specify

DRILLING METHOD ✓ cable, bored, forward rotary, reverse rotary, jetted, other (specify)

WELL CONSTRUCTION AND COMPLETION

of ed	Size and weight of casing	From (feet)	To (feet)	Perforations and/or Screen Kind Size	From (feet)	To (feet)
"	280 Steel	+18	23			
1/2	Plastic	6	930	1/2 Holes	83	93

Was casing left open end? ✓ Yes No
Was a packer or seal used? ✓ Yes No
If so, what material Rubber
Was the well gravel packed? Yes ✓ No
Was the well grouted? ✓ Yes No
To what depth? 0 - 23
Material used in grouting Bentonite Continuous
Well head completion: Pitless adapter +18 ✓ Yes No
Top of casing 12 in. or greater above grade ✓ Yes No

WHAT IS THE TEMPERATURE OF THE WATER?
Degrees Fahrenheit
☐ Measured ☐ Estimated

8. WATER LEVEL
Static water level 26 feet below land surface
If flowing; closed-in pressure psi
gpm
Controlled by: valve, reducers, other, (specify)

9. WELL TEST DATA pump ✓ bailer other, (specify)
Pumping water level below land surface:
40 ft. after 1 hrs. Bailing pumping 40 gpm
ft. after hrs. pumping gpm

10. WAS WELL PLUGGED OR ABANDONED? Yes ✓ No
If yes, how?

11. DATE COMPLETED July 22

12. WELL LOG

Depth (ft.) From	To	Formation
0	18	Washed shale & sand stone
18	30	Clay-Grey
30	58	Blue shale
58	65	Red shale 1/2 GPM
65	70	Light Gray shale
70	80	Sand stone Fraced
80	90	Grey Clay
90	93	Sand stone - Water

RECEIVED
AUG 27 1987
DEPT. OF NATURAL RESOURCES AND CONSERVATION
BILLINGS OFFICE

(use separate sheet if necessary)

13. DRILLER'S CERTIFICATION
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.
Aug 6 1987
Date
Bowen Drilling
Firm Name
McLeod Mont. 59052
Address
Thomas Bowen 294
Signature License No.

MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION **DNRC**
32 SOUTH EWING *HELENA, MONTANA 59620* *444-6610*

LISHING CO., HELENA, MONT.

DEPARTMENT - BUREAU COPY

097 01N 15E 05 CCB SWEET GRASS ⑨

orm No. 603 R2/81 File No.

LLINGS

WELL LOG REPORT

RECEIVED
OCT 25 1982
DEPT. OF NATURAL RESOURCES
AND CONSERVATION
BILLINGS OFFICE

State law requires that this form be filed by the water well driller within 60 days after completic

026791

WELL OWNER
Name Paul Gilbert

CURRENT MAILING ADDRESS
Box 763
Big Timber, MT

WELL LOCATION
County Sweetgrass
Township 1 [✓ N]/S Range 15 [✓ E]/W
NW¼ SW ¼ SW¼ Section 5
Lot Block
Subdivision

PROPOSED USE Domestic ☒ Stock ☐ Irrigation ☐
Other ☐ specify

DRILLING METHOD cable, bored,
X forward rotary, reverse rotary, jetted,
other (specify)

WELL CONSTRUCTION AND COMPLETION

of d	Size and weight of casing	From (feet)	To (feet)	Perforations and/or Screen Kind Size	From (feet)	To (feet)
,	6 5/8 18.97	+1	19			
	4" P.S.i PUC	10	140	3/16 slot	60	80
					100	120

Was casing left open end? X Yes No
Was a packer or seal used? Yes X No
If so, what material
Was the well gravel packed? Yes X No
Was the well grouted? X Yes No
To what depth? 19
Material used in grouting Puddled Clay
Well head completion: Pitless adapter
Yes No
Top of casing 12 in. or greater above grade
X Yes No

WHAT IS THE TEMPERATURE OF THE WATER?
Degrees Fahrenheit
☐ Measured ☐ Estimated

8. **WATER LEVEL**
Static water level 23 feet below land surface
If flowing, closed-in pressure psi
gpm
Controlled by: valve, reducers,
other, (specify)

9. **WELL TEST DATA** pump bailer
X other, (specify) air
Pumping level below land surface:
139 ft. after 1 hrs. pumping 22 gpm
ft. after hrs. pumping gpm

10. **WAS WELL PLUGGED OR ABANDONED?** Yes X No
If yes, how?

11. **DATE COMPLETED** 9-30-82

12. **WELL LOG**

Depth (ft.) From	To	Formation
0	1	top soil
20	41	Blue shale
41	46	Blue sandstone
46	42	Red shale
62	69	Blue sandstone
69	132	Blue shale
132	140	Blue sandstone

(use separate sheet if necessary)

13. **DRILLER'S CERTIFICATION**
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.
10-15-82
Date
B&H Drilling
Firm Name
Fishtail, MT
Address
Robert B Murphy 309
Signature License No.

MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION **DNRC**
32 SOUTH EWING *HELENA, MONTANA 59620* *449-3962*

printers of missoula

DEPARTMENT COPY

047 IN 15E 6 BC

No. 603 New 7-73

Sweetgrass

File No.

RECEIVED
APR 15 1977
MONT. DEPT. of NATURAL
ESOURCES & CONSERVATION

CODED

STATE OF MONTANA
Department of Natural Resources and Conservation

WHITE — DEPARTMENT
PINK — BUREAU
CANARY — WELL OWNER
GOLDENROD — DRILLER

WELL LOG REPORT

Sanitary Board
University Campus

State law requires that this form be filed by the water well driller on any water well completed by him on and after July 1, 1973 within sixty (60) days after completion of the well.

WELL OWNER: Name Veterinary Research Lab Address Bozeman Mont. 59715

ideKoffer Ranch

WELL LOCATION: County Sweet Grass Lot# 5 S½ SW¼ NW¼, Sec. 6, Twp. 1 N-S, Rg. 15 E-W

PROPOSED USE: [✓ Domestic] Stock Municipal Industrial Lawn and Garden Irrigation Other (*if other, specify*)

METHOD DRILLED: [✓ Cable] Bored Forward Rotary Reverse Rotary Jetted Other (*if other, specify*)

WELL CONSTRUCTION:
Diameter of hole 6 5/8 inches. Depth 46 ft.
Casing: [✓ Steel] [✓ Plastic] Concrete Threaded [✓ Welded] Other (*if other, specify*)

Pipe Weight: Dia.: From: To:
19 lb/ft. 6 5/8 inches 0.0 feet 21 feet
.F.S.1 lb/ft. 4½ inches 18 feet 46 feet
lb/ft. inches feet feet

Was perforated pipe used? [✓ Yes] No
Length of pipe perforated 20 feet
Was casing left open end? [✓ Yes] No
Was a well screen installed? Yes [✓ No]
Material Dia. inches
(*stainless steel, bronze, etc.*)
Perforation type: [✓ slots] holes
Size 1/16 set from 26 feet to 40 feet
Size set from feet to feet
Size set from feet to feet
Was a packer or seal used? Yes [✓ No]
If so, what material
Well type: Straight screen Graveled
Was the well grouted? Yes [✓ No]
To what depth? feet
Material used in grouting
Well head completion: Pitless adapter [✓]
12" above grade Other
(*If other, specify*)
Was the well disinfected? [✓ Yes] No

WATER LEVEL:
Static water level 20.6 ft. below land surface
If flowing: closed-in pressure psi
GPM flow through inch pipe
Controlled by: Valve Reducers Other, specify

WELL TEST DATA: [✓ Pump] Bailer Other
(*If other, specify*)
Pumping level below land surface:
28 ft. after 1 hrs. pumping 20 gpm
ft. after hrs. pumping gpm

8. WELL LOG:

Depth (ft.)		
From	To	Formation
0.0	11.7'	Br silty fill Material
11.7'	18.5'	Br. shale w/water 17.5-18.5
18.5'	32.0'	Gray Shale
32.0	46.0	Gray & Br. shale w/seam of water.

(*Use separate sheet if necessary*)

9. DATE STARTED: 4-5-77

10. DATE COMPLETED: 4-12-77

11. WAS WELL PLUGGED OR ABANDONED? Yes No
If so, how Capped

12. DRILLER'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.

I & I Drilling — 247
Driller's or Firm Name — *License No.*

Box 574 Big Timber, Mont. 59011
Address

Irvin Good — 4-13-77
Signed by — *Date*

GW 2 097 01N 14E 01CC
Sweet Grass

File No.

TRIPLICATE

⑪

Approved Stock Form—State Publishing Co., Helena, Montana—42329 3

①

097 T. 1N R. 14E - 1CC

County Sweet Grass

STATE OF MONTANA
ADMINISTRATOR OF GROUNDWATER CODE
OFFICE OF STATE ENGINEER

Notice of Completion of Groundwater Appropriation by Means of Well

DEVELOPED AFTER JANUARY 1, 1962

(Under Chapter 237, Montana Session Laws, 1961)

LOG

Top of Ground

(Elev. above sea level.......)

- 2
- 4 Top Soil & Clay
- 6
- 8
- 9½ static water level
- 10
- 12 Sand & Gravel with clay
- 14
- 16
- 17
- 18 Clay
- 19
- 20
- 22
- 24 Red Clay
- 26
- 27
- 28 Broken Shale
- 29 Shale
- Bottom of well

Show exact depth of bottom.

Owner Hans Beley Address

Driller Donald C. Jones Address 2107 Bridger Dr. Bozeman, Mont

Date of Notice of appropriation of groundwater

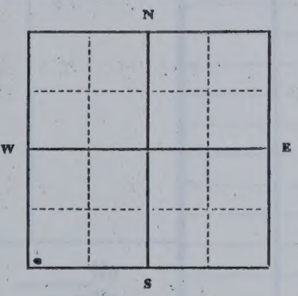
Date well started April 15, 1969 Date completed April 18, 1969

Type of well Drilled (Dug, Driven, bored or drilled) Equipment used Churn Drill (Churn drill, rotary or other)

Water use: Domestic ☒ Municipal ☐ Stock ☐ Irrigation ☐ Industrial ☐ Drainage ☐ Other ☐

Indicate on the diagram the character and thickness of the different strata met with in drilling, such as soil, clay, shale, gravel, rock or sand, etc. Show depth at which water is encountered, thickness and character of water-bearing strata and height to which the water rises in the well.

Size of Drilled Hole	Size and Weight of Casing	From (Feet)	To (Feet)	PERFORATIONS		
				Kind Size	From (Feet)	To (Feet)
6in	6 5/8" OD 17#	1½' above Ground	20½			
	5" I.D.	19	27	¼"x3" slot	19'	27'



SW ¼ Sec. 1 T. 1N R. 14E

Indicate location of well and place of use, if possible. Each small square represents 40 acres.

Static Water Level for non-flowing well 9½ feet.

Shut-in Pressure for Flowing Well —

Pumping Water Level 29 feet at 20 gal. per minute.

Discharge in gal. per min. of flowing well —

How Tested Pump

Length of Test 1hr.

Remarks: (Gravel packing, cementing, packers, type of shutoff)

(Continue on reverse side)

USE—If used for irrigation, industrial, drainage or other. Explain, state number of acres and location or other data (i.e.: Lot, Block and Addition).

RECEIVED
JUN 24 1969
Montana [illegible] of [illegible]

17
Driller's License Number

Donald C Jones
Driller's Signature

This form to be prepared by driller, and three copies to be filed by the owner with the County Clerk and Recorder in the county in which the well is located, tissue copy to be retained by driller.

Please answer all questions. If not applicable, so state, otherwise the form will be returned.

Form No. 603 R9/82

BILLINGS

53

File No.

WELL S LOG REPORT

State law requires that this form be filed by the water well driller within 60 days after completio

026797

(12)

WELL OWNER
Name Leland Giffen

CURRENT MAILING ADDRESS
Box 1212
Big Timber Mont 59011

WELL LOCATION
County Sweet Grass
Township 1 [✓ N]/S Range 15 [✓ E]/W
¼ ¼ ¼ Section 16
Lot 2 Block
Subdivision

PROPOSED USE Domestic ☒ Stock ☐ Irrigation ☐
Other ☐ specify

DRILLING METHOD ✓ cable, bored, forward rotary, reverse rotary, jetted, other (specify)

WELL CONSTRUCTION AND COMPLETION

e of lled e	Size and weight of casing	From (feet)	To (feet)	Perforations and/or Screen Kind Size	From (feet)	To (feet)
6	6" Steel 230	0	8			
4½	Plastic	5	100	½ holes	85	100

Was casing left open end? ✓ Yes No
Was a packer or seal used? ✓ Yes No
If so, what material Rubber
Was the well gravel packed? Yes ✓ No
Was the well grouted? Yes ✓ No
To what depth?
Material used in grouting
Well head completion: Pitless adapter Yes ✓ No
Top of casing 12 in. or greater above grade ✓ Yes No

WHAT IS THE TEMPERATURE OF THE WATER?
55 Degrees Fahrenheit
☐ Measured ☒ Estimated

8. WATER LEVEL
Static water level 70 feet below land surface
If flowing; closed-in pressure psi
gpm
Controlled by: valve, reducers, other, (specify)

9. WELL TEST DATA ✓ pump bailer other, (specify)
Pumping level below land surface:
95 ft. after 1 hrs. pumping 5 gpm
ft. after hrs. pumping gpm

10. WAS WELL PLUGGED OR ABANDONED? Yes ✓ No
If yes, how?

11. DATE COMPLETED Sept 6 1984

12. WELL LOG

Depth (ft.) From	To	Formation
0	2	Top Soil
2	14	Sand [illegible]
14	45	Clay
45	70	Blue Shale
70	100	Shale & Sand [illegible]

RECEIVED
OCT 23 1984
DEPT. OF NATURAL RESOURCES AND CONSERVATION BILLINGS OFFICE

(use separate sheet if necessary)

13. DRILLER'S CERTIFICATION
This well was drilled under my jurisdiction and this report is true to the best of my knowledge.
Oct 17, 1984
Date
Bowen Drilling
Firm Name
McLeod Mont 59052
Address
Thomas D. Bowen
Signature
294
License No.

MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION **DNRC**
32 SOUTH EWING HELENA, MONTANA 59620 449-3962

DEPARTMENT — BUREAU COPY

APPENDIX C

LANDFILL PLANS

(Detached)

CITY OF BIG TIMBER

SOLID WASTE MANAGEMENT
DRAFT
ALTERNATIVES ANALYSIS REPORT

Atlatl
Inc.

ENVIRONMENTAL
SCIENTISTS
& ENGINEERS

121002 Browns Gulch Road • Butte, MT 59701 • (406) 723-7980

CITY OF BIG TIMBER

SOLID WASTE MANAGEMENT
DRAFT
ALTERNATIVES ANALYSIS REPORT

March 27, 1996

prepared by:

ATLATL, INC.
Butte, Montana

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- Independent Contractor 11

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INTRODUCTION

The City of Big Timber has contracted Atlatl to investigate various solid waste collection and disposal alternatives and compare costs to the City's current solid waste budget. This draft report examines the following alternatives:

1. The City continues to collect city waste and operate the existing landfill.
2. The City closes the existing landfill, permits a Class III landfill and a transfer (roll-off) site at the existing landfill, and continues to collect city waste. An independent contractor transports the roll-offs to an out of county landfill.
3. The City contracts with an independent contractor to collect city waste and haul the waste to an out of county landfill.

In addition to the above list, there are a number of other solid waste management options, including using City forces to collect and haul waste to an out of county landfill. Upon the City's review of this draft report Atlatl will further investigate disposal alternatives based on the City's comments.

EXISTING CONDITIONS

The City's current solid waste budget has been reviewed and is summarized in Table 1. In some instances the budget records combined collection and landfill expenses. Where possible, landfill only expenses have been separated from combined landfill and collection expenses in Table 1. For those expenses that could not be separated, it was estimated that two thirds of the expenses go to the landfill with the other third going to collection.

The City receives solid waste revenues through quarterly billings to system subscribers and landfill fees. Revenue calculations based on users and rates as of October 1, 1995 are listed in Table 2.

TABLE 1
CITY OF BIG TIMBER
CURRENT ESTIMATED SOLID WASTE EXPENSES

Item	Estimated Annual Expense
LANDFILL AND COLLECTION OPERATING EXPENSES	
100. Personal services	75,450
200. Supplies	8,500
231. Gas, oil, diesel, grease, etc.	8,000
300. Purchased services	0
340. Utility services	500
350. Professional services	0
510. Insurance	6,000
810. Inter dept. charges	300
900. Capital outlay	0
Equipment and building depreciation	6000
SUBTOTAL	**$104,750**
LANDFILL ONLY EXPENSES	
License fee (2500 + 0.31 x 1500 tons)	2,965
Groundwater and Methane Monitoring	11,000
Annual Professional Engineer Inspection	1,000
Closure and Post-Closure Fund	36,300
Bond repayment	42,000
SUBTOTAL	**$94,265**
TOTAL ANNUAL LANDFILL EXPENSES(1)	**$164,102**

(1) Based on 2/3 of total landfill and collection expenses plus landfill only expenses (2/3 x 104,750 + 94,625).

TABLE 2
CITY OF BIG TIMBER
CURRENT ESTIMATED SOLID WASTE REVENUES

Quarterly Rate	# of users	Revenue
City Subscribers		
60.02	672	40,333.44
80.32	65	5,220.80
120.04	3	360.12
119.91	25	2,997.75
158.35	7	1,108.45
180.07	3	540.21
237.41	12	2,848.92
239.91	1	239.91
241.03	1	241.03
259.82	2	519.64
321.54	2	643.08
420.14	1	420.14
474.90	6	2,849.40
479.84	1	479.84
500.13	1	500.13
712.46	2	1,424.92
719.72	1	719.72
993.04	1	993.04
1,200.41	1	1,200.41
1,440.43	1	1,440.43
1,599.02	1	1,599.02
	Subtotal	$66,680.40
Out of Town Subscribers		
40.60	29	1,177.40
99.89	4	399.56
130.06	1	130.06
197.87	1	197.87
692.97	1	692.97
	Subtotal	$2,597.86
3 CY containers		
37.00	7	259.00
4 CY containers		
46.00	8	368.00
6 CY containers		
54.00	10	540.00
8 CY containers		
63.00	5	315.00
	Subtotal	$1,482.00
QUARTERLY SUBSCRIBER TOTAL		$70,760.26
ANNUAL LANDFILL FEES (1994)		$11,873.00
INTEREST INCOME (1994)		$6,888.00
TOTAL ANNUAL REVENUE = **$6,888 + $11,873 + (4 x $70,760) =**		**$301,801.00**

ALTERNATIVES ANALYSIS

For purposes of comparing solid waste management system alternatives, the number of equivalent residential units has been calculated as follows:

Quarterly revenue from city subscribers (Table 2) = $66,680.40
Quarterly rate per residential unit (Table 2) = $60.02
Equivalent residential units = $66,680.40 ÷ $60.02 = 1,110

Upgrade Existing Landfill

The current trench will be filled to capacity in approximately two years. Any new trenches will have to be permitted through the state under the new solid waste regulations. State regulations now require that new landfill units have composite liner and cover systems and a leachate collection system. For purposes of this study, typical liner and cover systems were assumed and are illustrated on Figure 1.

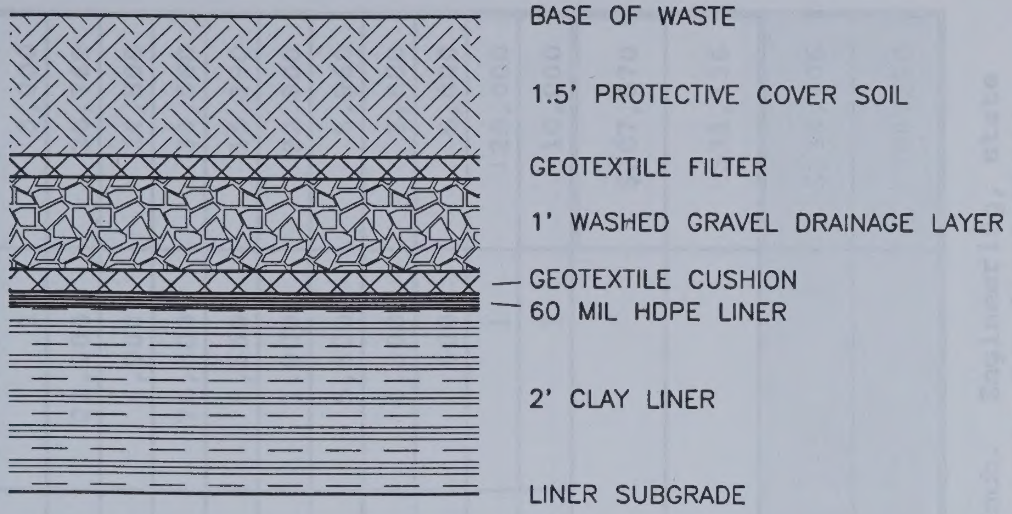
The currently permitted trench system calls for trenches with 0.5:1 side slopes. It is not feasible to construct composite liner systems on such steep slopes. Side slope ratios of 3:1 or less are recommended for liner installations. Therefore, for purposes of this study, the following cut and fill plan has been assumed:

- three large trenches or cells with the same combined capacity as the currently planned nine trenches;
- the trenches measure 300′ wide by 600′ long, each with a twenty year life; and
- each trench will be constructed in four, five year phases (300′ x 150′) over a 20 year period.

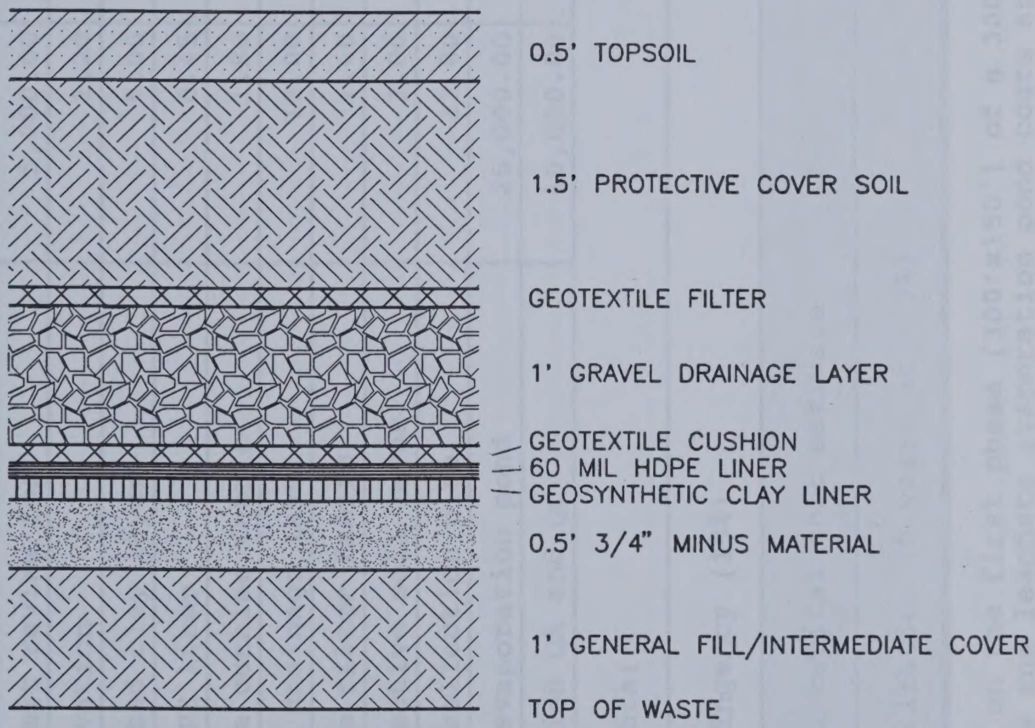
Costs for the initial five year phase of a new trench are summarized in Table 3. The new trench costs are amortized over the life of each phase (5 years), as a new phase (300′ x 150′ trench section) will have to be constructed in five years.

State regulations require the closure of each landfill unit (trench) when it is filled to capacity. Closure costs, based on closing a 300′ x 600′ trench in twenty years, are summarized in Table 4.

Post-closure costs are tabulated in Table 5.


BASE OF WASTE
1.5' PROTECTIVE COVER SOIL
GEOTEXTILE FILTER
1' WASHED GRAVEL DRAINAGE LAYER
GEOTEXTILE CUSHION
60 MIL HDPE LINER
2' CLAY LINER
LINER SUBGRADE

TYPICAL LINER DESIGN


0.5' TOPSOIL
1.5' PROTECTIVE COVER SOIL
GEOTEXTILE FILTER
1' GRAVEL DRAINAGE LAYER
GEOTEXTILE CUSHION
60 MIL HDPE LINER
GEOSYNTHETIC CLAY LINER
0.5' 3/4" MINUS MATERIAL
1' GENERAL FILL/INTERMEDIATE COVER
TOP OF WASTE

TYPICAL COVER DESIGN

ATLATL
INC.

LINERTYP

TYPICAL LANDFILL
LINER & COVER DESIGNS

FIGURE 1

TABLE 3
BIG TIMBER LANDFILL
NEW LANDFILL CELL CONSTRUCTION COST ESTIMATE

Item	Cost/Unit	Units	Quantity(1)	Cost
Engineering to permit new cell	20,000.00	lump sum	1	20,000
State permit review fee	5,000.00	lump sum	1	5,000
Cell excavation	1.20	cu.yd.	22,300	26,760
2′ compacted clay layer	5.00	cu.yd.	4,900	24,500
60 mil HDPE liner	0.45	sq.ft.	76,800	34,560
Geotextile cushion fabric	1.80	sq.yd.	8,550	15,390
1′ gravel drainage layer	12.00	cu.yd.	1,900	22,800
Geotextile filter fabric	1.60	sq.yd.	5,600	8,960
1.5′ protective soil layer	2.00	cu.yd.	4,300	8,600
Leachate collection pipe	12.00	lin.ft.	500	6,000
Leachate evaporation pond	25,000.00	lump sum	1	25,000
Construction QA and QC	10,000.00	lump sum	1	10,000
Subtotal				$207,570
Contingency (15%)				$31,136
Total capital cost estimate				$238,706
Amortization (5 years at - 7%)				$58,220

(1) Based on the first phase (300′x150′) of a 300′x600′ trench. Engineering, state review and leachate evaporation pond costs are one time costs for first phase work and shouldn′t be necessary for subsequent phases.

TABLE 4
BIG TIMBER LANDFILL
NEW LANDFILL CELL CLOSURE COST ESTIMATE

Item	Cost/Unit	Units	Quantity	Cost
Contour site and apply intermediate cover	Included in operating costs			
6" bedding layer (3/4" minus)	12.00	cu.yd.	4,400	52,800
Geosynthetic clay liner	0.65	sq.ft.	253,125	164,531
60 mil HDPE liner	0.45	sq.ft.	253,125	113,906
Geotextile cushion fabric	1.80	sq.yd.	28,125	50,625
12" gravel drainage layer	12.00	cu.yd.	9,375	112,500
18" protective cover layer	1.50	cu.yd.	14,050	21,075
6" topsoil layer	2.00	cu.yd.	4,700	9,400
Seeding and mulching	600.00	acre	6	3,600
Construction QA and QC	25,000.00	lump sum	1	25,000
Subtotal				$553,437
Contingency (15%)				$83,016
Total closure cost estimate				$636,453
Closure trust fund payment(1)				$31,823

(1) 1/20th of total cost based on a landfill unit (cell) life of 20 years for a 20 year pay in period as per ARM 16.40.540(5)(ii & iii).

TABLE 5
BIG TIMBER LANDFILL
POST-CLOSURE COST ESTIMATE
ANNUAL COSTS FOR 30 YEARS AFTER CLOSURE

Item	Annual Cost
Groundwater monitoring	10,000
Methane monitoring	1,000
Annual inspections and reporting	1,000
Cap maintenance	1,000
Subtotal	$13,000
Contingency (15%)	$1,950
Total annual post-closure cost estimate	$14,950
Total cost for 30 years	$448,500
Post-Closure trust fund payment(1)	$4,983

(1) 1/90th of the total cost based on a 60 year landfill life plus 30 years post-closure for a 90 year pay-in period as per ARM 16.40.540(5)(ii & iii).

Roll-off/Class III System

This alternative looks at converting the existing Class II landfill to a combination container site/Class III landfill and hauling the Class II waste to an out of county landfill. A number of area landfills were contacted to see if they would accept Big Timber waste for disposal.

- Gallatin County indicated that the Logan landfill would accept Big Timber waste at a tentative drop charge of $28.00 per ton.
- The Bozeman landfill indicated that they currently charge $32.00 per ton for municipal waste, but that they only accept City of Bozeman Gallatin county waste. It would take a formal request to the Bozeman City Manager in order to accept Big Timber's waste.
- The Billings landfill will be charging approximately $10.00 per ton after July 1, 1996. However, they only accept waste from Yellowstone and adjacent counties. It would take a formal request to the Billings City Council in order to accept Big Timber's waste.
- Mister "M" disposal in Lewistown indicated they may be willing to accept Big Timber waste, but didn't offer any budget figures for disposal costs per ton.
- The Park County incinerator may be willing to accept Big Timber's waste but the County Commissioners would have to make the final decision. The incinerator is currently operating close to maximum capacity.

Estimated costs to construct, equip and operate a combination roll-off/Class III landfill are summarized in Table 6. The costs assume the following:

- a three roll-off container site with 40 cubic yard containers;
- an independent hauler from Bozeman would drop off two empty containers and pick up two full containers for transport to Logan;
- twice per year a contractor would cover the Class III waste and excavate a new disposal pit; and
- the site would be open 2 days per week for 4 hours per day and an operator would be on duty to monitor the incoming waste loads and direct the public to either the container area or the Class III area.

TABLE 6
BIG TIMBER LANDFILL
CONVERT TO CONTAINER SITE & CLASS III LANDFILL
CAPITAL AND ANNUAL COST ESTIMATE

Item	Cost
CAPITAL COST	
Concrete construction	50,000
Site screening	50,000
Earthwork and gravel	12,000
State permit review fee	3,000
Engineering	14,000
Subtotal	$129,000
Contingency (15%)	19,350
TOTAL CAPITAL COST	148,350
ANNUAL COST	
Capital amortization (20 yrs @ 7%)	14,000
Container amortization ($16,500 for 5 yrs @ 7%)	4,100
Gate attendant (8 hrs/wk)	5,000
Periodic trench maintenance (Class III)	1,500
Container maintenance	1,500
State license fee (Class III)	900
Subtotal	$27,000
Contingency (15%)	$4,050
TOTAL ANNUAL FACILITY COST	31,050

Independent Contractor

An independent contractor would collect and haul Big Timber waste to an out of county landfill. This alternative would not require a transfer station (container site). The collection trucks would haul the waste directly to the landfill.

Three Rivers Disposal is interested in providing this service for the City of Big Timber and has offered the following rate structure for estimating purposes.

Basic residential rate	$15.95/mo.
Less 10% for 5 yr. contract	-1.60
less 10% for mandatory service	-1.60
less 10% for city handles billing	-1.60
plus 3% for performance bond	+0.48
TOTAL RATE	$11.63/mo.

Using the basic residential rate of $11.63 per month and 1,110 equivalent residential units as calculated on page 1, the total annual cost to the residents and businesses (subscribers) of the City of Big Timber is:

1,110 x $11.63/mo. x 12mo./yr. = $154,900

The validity of using equivalent residential units in the above calculation is based on the following:

- the City's rate structure for commercial accounts is volume based;
- commercial rate to volume ratios are directly proportional to residential rate to volume ratios; and
- Three Rivers will offer a similar volume based rate for commercial accounts.

The $154,900 annual cost does not include repayment of the existing bond or cover annual post-closure monitoring expenses. These additional costs are included in Table 7.

SUMMARY DISCUSSION

The total annual system costs for each of the three alternatives are summarized in Table 7. As indicated in the table, the lowest cost alternative is contracting a disposal company to collect and haul waste directly to an out of county landfill. The $184 per year cost per residential unit for this alternative is 23% less than the current rate of $240 per year.

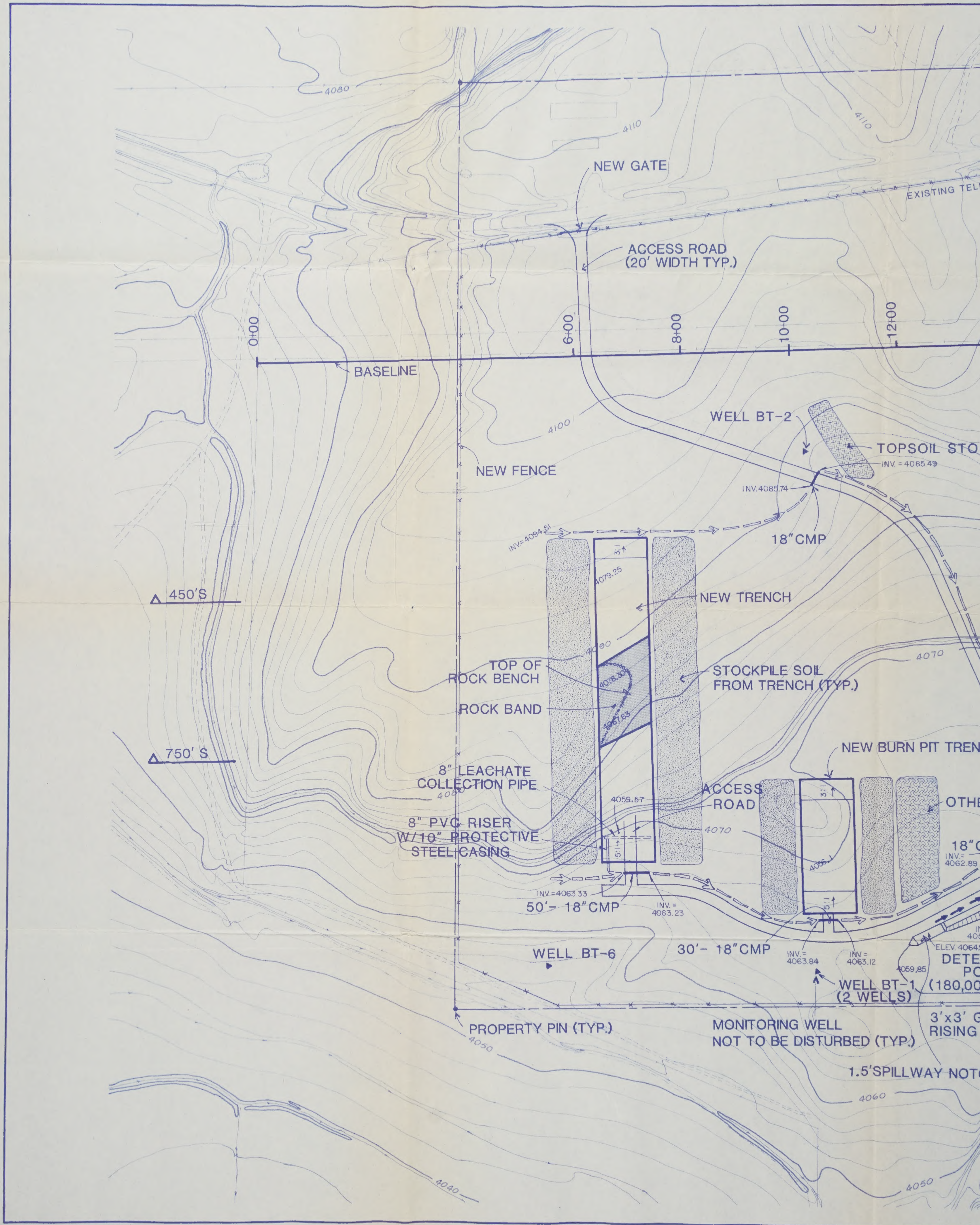
Big Timber should be able perform the same services as the private disposal company for a similar cost with the exception that a new truck would have to be purchased.

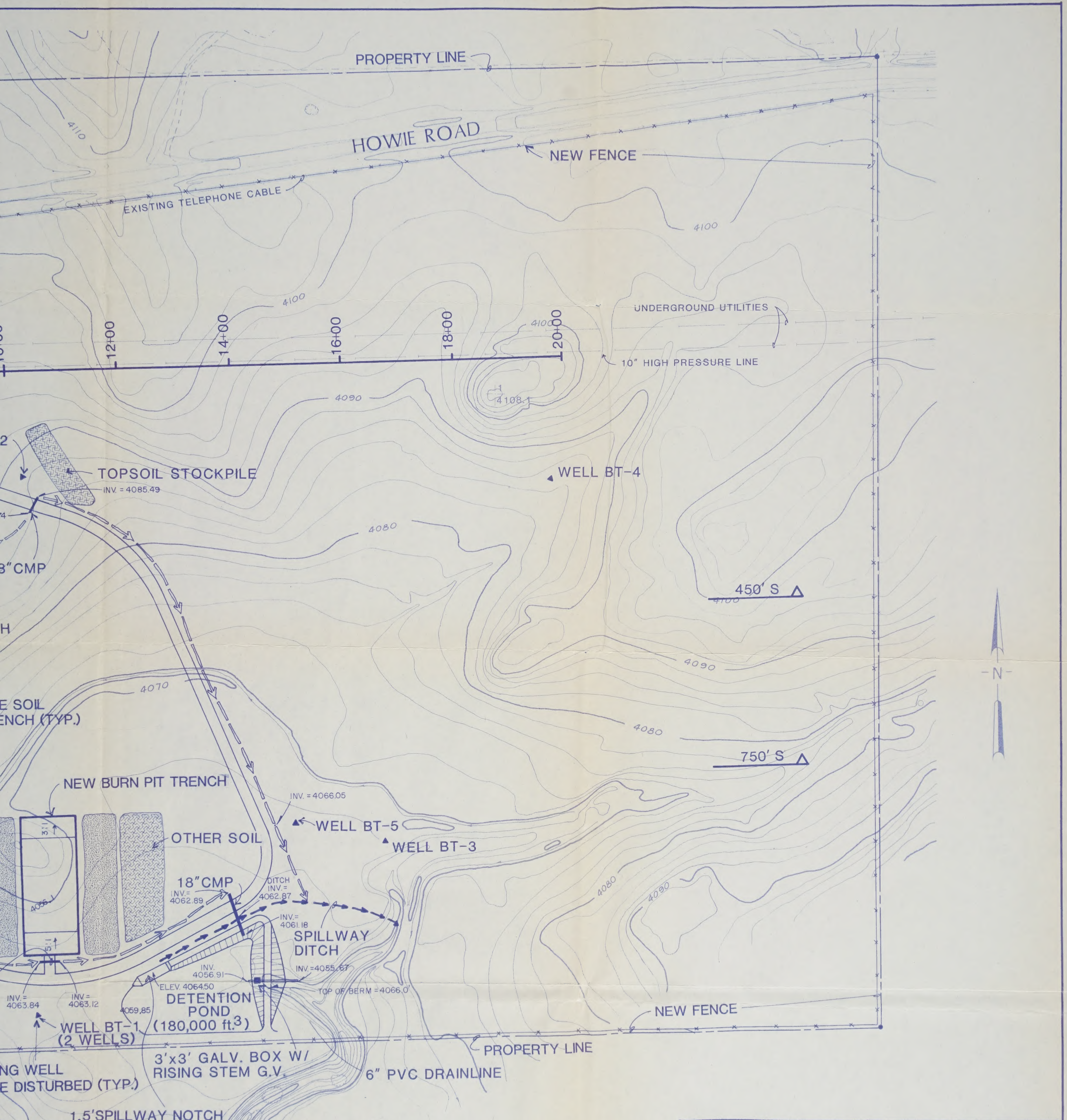
Mister "M" Disposal in Lewistown, Three Rivers Disposal and Customized Services in Bozeman, and BFI in Missoula and Billings indicated they would be interested in responding to a RFP to provide waste management services for Big Timber. These services could include collecting waste and hauling directly to a landfill, or transporting roll-offs from a City or privately owned container site to a landfill.

TABLE 7
CITY OF BIG TIMBER
SOLID WASTE MANAGEMENT ALTERNATIVES COST SUMMARY

ITEM	USE EXISTING LANDFILL		ROLL-OFF/ CLASS III SYSTEM (to Logan)	INDEPENDENT CONTRACTOR
	Current Trench	New Trench With Liner		
1. New trench capitalization	-	58,200	-	-
2. Landfill expenses(1)	69,800	69,800	-	-
3. Collection expenses(2)	34,900	34,900	34,900	-
4. Closure trust fund	16,600	31,800	-	-
5. Post-closure trust fund	14,000	5,000	14,000	14,000
6. Existing bond repayment	42,000	42,000	42,000	42,000
7. License fee	3,000	3,000	-	-
8. Groundwater & methane monitoring	11,000	11,000	-	-
9. Annual inspection	1,000	1,000	-	-
10. Interest from sale of landfill equipment	-	-	(7,000)	(7,000)
11. Landfill fee(3)	-	-	42,000	-
12. Roll-off/Class III site	-	-	31,100	-
13. Transfer cost(4)	-	-	70,300	-
14. Independent contractor	-	-	-	154,900
TOTAL ANNUAL DISPOSAL COST	$192,300	$256,700	$227,300	$203,900
COST PER EQUIVALENT UNIT/YR(5)	$173	$231	$205	$184

(1) Two-thirds of landfill and collection expenses from Table 1.
(2) One-third of landfill and collection expenses from Table 1.
(3) Based on tipping fee of $28/ton at the Logan landfill (1,500 tons per year).
(4) Based on $75.00 per hour, 8 tons per trip (2 containers) and 5 hours per trip.
(5) Based on 1,110 equivalent residential units (see calculation on page 4).


4080
4110
4110
NEW GATE
EXISTING TEL
ACCESS ROAD
(20' WIDTH TYP.)
0+00
6+00
8+00
10+00
12+00
BASELINE
4100
WELL BT-2
TOPSOIL STO
INV. = 4085.49
NEW FENCE
INV. 4085.74
INV=4094.51
18"CMP
3:1
4079.25
NEW TRENCH
450' S
4090
TOP OF
ROCK BENCH
4078.30
STOCKPILE SOIL
FROM TRENCH (TYP.)
4070
ROCK BAND
4067.63
750' S
NEW BURN PIT TREN
8" LEACHATE
COLLECTION PIPE
4080
ACCESS
ROAD
OTHE
4059.57
8" PVC RISER
W/10" PROTECTIVE
STEEL CASING
4070
5:1
3:1
4056
18"C
INV.=
4062.89
5:1
INV.=4063.33
50'- 18"CMP
INV. =
4063.23
ELEV. 4064.
DETE
PO
WELL BT-6
30'- 18"CMP
INV. =
4063.84
INV. =
4063.12
4059.85
WELL BT-1
(2 WELLS)
(180,00
PROPERTY PIN (TYP.)
4050
MONITORING WELL
NOT TO BE DISTURBED (TYP.)
3'x3' G
RISING
1.5'SPILLWAY NOTC
4060
4040
4050


PROPERTY LINE
HOWIE ROAD
NEW FENCE
EXISTING TELEPHONE CABLE
4110
4100
4100
UNDERGROUND UTILITIES
12+00
14+00
16+00
18+00
20+00
4100
10" HIGH PRESSURE LINE
4090
4108.1
2
TOPSOIL STOCKPILE
INV. = 4085.49
4
WELL BT-4
4080
8"CMP
H
450' S
4100
4090
-N-
4070
E SOIL
ENCH (TYP.)
4080
750' S
NEW BURN PIT TRENCH
INV. = 4066.05
WELL BT-5
WELL BT-3
OTHER SOIL
3:1
5:1
4056
18"CMP
INV.=
4062.89
DITCH
INV.=
4062.87
INV.=
4061.18
SPILLWAY
DITCH
4080
4090
INV.
4056.91
INV.=4055.67
ELEV. 4064.50
TOP OF BERM = 4066.0'
INV.=
4063.84
INV.=
4063.12
4059.85
DETENTION
POND
(180,000 ft.3)
WELL BT-1
(2 WELLS)
NEW FENCE
PROPERTY LINE
3'x3' GALV. BOX W/
RISING STEM G.V.
NG WELL
E DISTURBED (TYP.)
6" PVC DRAINLINE
1.5'SPILLWAY NOTCH
4060
4050

NEW LANDFILL SITE PLAN	JOB NO. ________ SCALE 1"= 100'
SANITARY LANDFILL for the CITY of BIG TIMBER, MT.	DESIGNED B.C. DRAWN B.A.N. APPROVED B.D. DATE 9/17/91
D&A **DAMSCHEN & ASSOCIATES, INC.** CONSULTING ENGINEERS 2030 11TH AVENUE • SUITE 11 P.O. BOX 4817 • HELENA, MT 59604 TELEPHONE (406) 449-8627	SHEET NO. 1 of 2

Atlatl Inc.
ENVIRONMENTAL SCIENTISTS & ENGINEERS

121002 Browns Gulch Road • Butte, MT 59701
(406) 723-7980 • FAX (406) 723-7981

RECEIVED
APR 17 1996
Montana Department of
Environmental Quality
Waste Management Division

April 16, 1996

Lois D. Stevens
City of Big Timber
P.O. Box 416
Big Timber, MT 59011

Re: Solid Waste Management - Draft Alternatives Analysis Report - Addendum.

Dear Lois:

Here's the addendum. See you at Monday's meeting.

Sincerely,

Ed Janney

Ed Janney, P.E.
Principal Engineer

Enclosure

cc w/encl.: Rick Thompson, MDEQ

File:- Big Tim
Class III, General
Working File. ✓

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CITY OF BIG TIMBER

SOLID WASTE MANAGEMENT
DRAFT
ALTERNATIVES ANALYSIS REPORT

ADDENDUM

April 16, 1996

prepared by:

ATLATL, INC.
Butte, Montana

This addendum discusses the sale of the Big Timber landfill and examines another independent contractor alternative not covered in the March 27, 1996 draft report. Costs for the new alternative are listed in the attached revised copy of Table 7.

SALE OF CITY LANDFILL

In terms of landfill availability, Big Timber is a fairly isolated community. The Billings and Bozeman landfills are not interested in accepting Big Timber waste. Logan landfill in Gallatin County is the closest landfill that has shown an interest in taking Big Timber's waste. Logan is also interested in taking Park County waste.

One of the main considerations of any potential landfill buyer would be; Could enough waste be brought in to make the disposal cost per ton more competitive? The Logan landfill, at 85 acres, has a remaining life of 25 to 30 years at a filling rate of 2000 to 3000 tons per month. The Logan landfill charges $28/ton. For the Big Timber landfill, at the present waste disposal rate of 1500 tons/year, the disposal cost under private ownership would be $120/ton calculated as follows:

$256,700 total annual disposal cost from Table 7
-$34,900 less collection expenses from Table 7
-$42,000 less existing bond repayment from Table 7
$179,800 ÷ 1500 tons/year = $120/ton

In order to get the disposal cost in the $30/ton range, the Big Timber landfill would have to attract at least 6000 tons of waste per year ($179,800 ÷ $30/ton = 6000 tons/year).

At 6000 tons year, a private owner would probably have to revise the present cell development plan, since a five year cell as presently permitted would be filled in just over one year's time. A larger cell would result in higher cell development and amortization costs. Therefore, without analyzing new cell development costs in detail, it is probably safe to say that significantly more than 6000 tons of waste per year would be needed to be a competitive facility. A private owner would also want to make sure that any new cell development plan would result in at least 25 to 30 years of life at the higher filling rates.

INDEPENDENT CONTRACTOR - BFI

This alternative looks at transporting Big Timber's waste by rail to BFI's Missoula landfill for disposal. For this alternative a container site and Class III landfill would be needed. The City would continue to collect waste and haul the waste to the container site. BFI would then transport the containers to a Montana Rail Link spur in Big Timber. The estimated costs for this alternative are summarized in Table 7.

TABLE 7 - REVISED
CITY OF BIG TIMBER
SOLID WASTE MANAGEMENT ALTERNATIVES COST SUMMARY

ITEM	USE EXISTING LANDFILL		ROLL-OFF/ CLASS III SYSTEM (to Logan)	INDEPENDENT CONTRACTOR	
	Current Trench	New Trench With Liner		Three Rivers	BFI
1. New trench capitalization	-	58,200	-	-	-
2. Landfill expenses(1)	69,800	69,800	-	-	-
3. Collection expenses(2)	34,900	34,900	34,900	-	34,900
4. Closure trust fund	16,600	31,800	-	-	-
5. Post-closure trust fund	14,000	5,000	14,000	14,000	14,000
6. Existing bond repayment	42,000	42,000	42,000	42,000	42,000
7. License fee	3,000	3,000	-	-	-
8. Groundwater & methane monitoring	11,000	11,000	-	-	-
9. Annual inspection	1,000	1,000	-	-	-
10. Interest from sale of landfill equipment	-	-	(7,000)	(7,000)	(7,000)
11. Landfill fee(3)	-	-	42,000	-	28,500
12. Roll-off/Class III site	-	-	31,100	-	31,100
13. Transfer cost(4)	-	-	31,000	-	32,300
14. Independent contractor(5)	-	-	-	154,000	-
15. Rail spur load and unload	-	-	-	-	11,200
TOTAL ANNUAL DISPOSAL COST	$192,300	$256,700	$188,000	$203,000	$187,000
COST PER EQUIVALENT UNIT/YR(6)	$173	$231	$169	$183	$168

(1) Two-thirds of landfill and collection expenses from Table 1.
(2) One-third of landfill and collection expenses from Table 1.
(3) Based on tipping fee of $28/ton at the Logan landfill and $19/ton at BFI's Missoula landfill (1,500 tons per year).
(4) Highway to Logan based on $75.00 per hour, 20 tons per trip (2 containers) and 5.5 hours per trip, and rail to Missoula at $850/car, four rolloff boxes per car, and 10 tons per rolloff box.
(5) Collection, transfer and disposal.
(6) Based on 1,110 equivalent residential units (see calculation on page 4).

Atlatl Inc.
ENVIRONMENTAL SCIENTISTS & ENGINEERS

121002 Browns Gulch Road • Butte, MT 59701
(406) 723-7980 • FAX (406) 723-7981

March 27, 1996

Lois D. Stevens
City of Big Timber
P.O. Box 416
Big Timber, MT 59011

Re: Solid Waste Management - Draft Alternatives Analysis Report

Dear Lois:

Here are six copies of the referenced report. Not all of the alternatives listed in our agreement have been covered in the report. After seeing the results of the reported alternatives, I thought that it would be better to submit a draft report at this time, meet with the Solid Waste Committee or City Council, and using the information in the report, re-evaluate any alternatives for further study.

I'm planning on attending the April 15th City Council meeting to discuss the report and set up a plan for finalizing the report. Meanwhile, if you have any questions or concerns, please don't hesitate to call.

Sincerely,

Ed Janney

Ed Janney, P.E.
Principal Engineer

Enclosure

cc w/encl.: Jim Wilbur, MDEQ

RECEIVED
RCS
MAR 28 1996
Montana Department of
Environmental Quality
Waste Management Division

Route to
RT ✓
P³ ✓

File: Sweetgrass Co/
Big Timber landfill
MAIN file (lic # 308)

Printed on recycled paper

NO. 6821 DATE.ENTERED 01-28-98

AUTHOR

TITLE SWEET GRASS COUNTY MAP - BIG TIMBER PLAN OF OPERATION

SW LIC.NO 308 SW DATE RECEIVED 12-05-90

GUIDANCE DATE 02-01-90 DOCUMENT LOCATION SW-MAP CASE

STATUS DIR.NO

CHECKOUT DATE RETURN DATE

CHECKED OUT TO WHOM:

Burn Permit Cu
Big Timber l.f.
~~Stillwater~~ Co.
Sweetgrass #308

DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMITTING AND COMPLIANCE DIVISION

MARC RACICOT, GOVERNOR

1520 East Sixth Avenue

STATE OF MONTANA

(406) 444-3454
(406) 444-3671
FAX (406) 444-5275

PO BOX 200901
HELENA, MONTANA 59620-0901

RECEIVED
OCT 28 1996
Montana Department of
Environmental Quality
Waste Management Division

October 28, 1996

Ron Thomas
City of Big Timber
P.O. Box 416
Big Timber, Montana 59011

Dear Mr. Thomas:

Air Quality Open Burning Permit #LF-551, issued by the Department of Environmental Quality, is final as of October 27, 1996. Burning may take place on days of good ventilation until November 26, 1996. If the burn has not occurred as of November 26, 1996, a new permit will need to be issued.

Sincerely,

Vickie Liva-Walsh

Vickie Liva-Walsh
Air Quality Specialist

VLW:tc

cc: Sweet Grass County Sanitarian
Waste Management Program

Burn Permit
Big Timber
Sweet Grass Co. #308

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

MARC RACICOT, GOVERNOR

1520 East Sixth Avenue

STATE OF MONTANA

~~(406) 444-3454~~
(406) 444-3671
FAX (406) 444-5275

~~PO BOX 200901~~
HELENA, MONTANA 59620-0901

June 10, 1996

RECEIVED
JUN 10 1996
Montana Department of
Environmental Quality
Waste Management Division

Jay Graham
City of Big Timber
P.O. Box 416
Big Timber, Montana 59011

Dear Mr. Graham:

Air Quality Open Burning Permit #LF-536, issued by the Department of Environmental Quality, is final as of June 9, 1996. Burning may take place on days of good ventilation until July 8, 1996. If the burn has not occurred as of July 8, 1996, a new permit will need to be issued.

Sincerely,

Vickie Liva-Walsh

Vickie Liva-Walsh
Air Quality Specialist

VLW:tjl

cc: Sweetgrass County Sanitarian
Waste Management Division

Big Timber L.F.
Burn Permit
Sweet Grass
(12

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

MARC RACICOT, GOVERNOR

1520 East Sixth Avenue

STATE OF MONTANA

(406) 444-3454
(406) 444-3671
FAX (406) 444-5275

PO BOX 200901
HELENA, MONTANA 59620-0901

May 24, 1996

RECEIVED
MAY 28 1996
Montana Department of
Environmental Quality
Waste Management Division

Jay Graham
City of Big Timber
P.O. Box 416
Big Timber, Montana 59011

Dear Mr. Graham: RE: Permit #LF-536

Your landfill open burning permit application to burn untreated wood waste has been approved, and has been given permit #LF-536. This permit shall become final on June 9, 1996 unless the department's final decision is appealed to the Board of Environmental Review. The burn is subject to the following conditions:

1. Burning will occur after the permit becomes final.

2. Burning will take place on days of good ventilation. Call 444-3454 for the ventilation forecast prior to ignition. The division will give permission for the burn by 8 a.m. on the date of the burn, if ventilation is adequate.

3. Adequate fire control will be present at all times and is the responsibility of the person or persons lighting the fire.

4. The fire must be completely extinguished at the end of the day. No smoking piles will be allowed overnight.

5. Only untreated wood waste may be burned. Prohibited items must be removed from the pile prior to ignition. The pile shall be free of dirt and contaminants which retard combustion.

6. This permit is good for a single burn only. The actual burn date is left up to the landfill operator; however, you must notify the Air Quality Division of the date selected (telephone 444-3454). This may be done at the same time you call for the ventilation forecast. The Sweetgrass County Sanitarian must also be notified prior to the burn.

7. **This permit expires July 8, 1996.** If the burn has not occurred as of this date, a new permit will need to be issued.

8. Adjacent residents and the local fire control authority must be notified prior to ignition.

9. Ash from the fire shall not be buried in the same trench used for your operating landfill. This is to prevent underground trash fires from becoming a problem in the landfill itself.

10. Ashes are considered a Group II waste, which are to be disposed of properly in a licensed Class II landfill.

11. Any public nuisance resulting from this open burning will be cause for revocation of this permit. The fire must be extinguished immediately if it is determined by the division to be a public nuisance.

12. Issuance of this permit does not release the operator from liability for impacts from this burn.

Sincerely,

David L Klemp for

Jeff Bellino
Air Quality Specialist

JB:tjl

Enclosure

cc: Sweetgrass County Sanitarian
Waste Management Division

General Conditions
City of Big Timber
LF-536

A. Inspection

The recipient shall allow the department's representatives access to the source at all reasonable times for the purpose of making inspections, surveys, collecting samples, obtaining data, and otherwise conducting all necessary functions related to this permit.

B. Waiver

The permit and all the terms, conditions, and matters stated herein shall be deemed accepted if the recipient accepts the permit.

C. Compliance with Statutes and Regulations

Specific listing of requirements, limitations, and conditions contained herein does not relieve the applicant from compliance with all applicable statutes and administrative regulations including amendments thereto, nor waive the right of the department to require compliance with all applicable statutes and administrative regulations, including amendments thereto.

D. Enforcement

Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties or other enforcement as specified in Section 75-2-401, MCA.

E. Application Data

Information submitted on behalf of an air quality permit application is hereby incorporated as a condition of that permit including commencement and completion dates of construction.

F. Permit Inspection

As required by ARM 16.8.1115 Inspection of Permit, a copy of the air quality permit shall be made available for inspection by department personnel at the location of the permitted source.

Open Burn Permit
Big Timber l.f.

DEPARTMENT OF ENVIRONMENTAL QUALITY

MARC RACICOT, GOVERNOR

STATE OF MONTANA

RECEIVED

AUG 24 1995

Montana Department of
Environmental Quality
Waste Management Division

August 24, 1995

Ron Thomas
City of Big Timber
P.O. Box 416
Big Timber, MT 59011

Dear M. Thomas: RE: Permit #LF-507

Your landfill open burning permit application to burn untreated wood waste has been approved, and has been given permit #LF-507. This permit shall become final on Sept. 8, 1995, unless the department's final decision is appealed to the Board of Health and Environmental Sciences. The burn is subject to the following conditions:

1. Burning will occur after the permit becomes final.
2. Burning will take place on days of good ventilation. Call 444-3454 for the ventilation forecast prior to ignition. The division will give permission for the burn by 8 a.m. on the date of the burn, if ventilation is adequate.
3. Adequate fire control will be present at all times and is the responsibility of the person or persons lighting the fire.
4. **The fire must be completely extinguished at the end of the day. No smoking piles will be allowed overnight.**
5. Only untreated wood waste may be burned. Prohibited items must be removed from the pile prior to ignition. The pile shall be free of dirt and contaminants which retard combustion.
6. This permit is good for a single burn only. The actual burn date is left up to the landfill operator; however, you must notify the Air Quality Division of the date selected (telephone 444-3454). This may be done at the same time you call for the ventilation forecast. The Stillwater County Sanitarian must also be notified prior to the burn.
7. **This permit expires October 7, 1995.** If the burn has not occurred as of this date, a new permit will need to be issued.

"AN EQUAL OPPORTUNITY EMPLOYER"

8. Adjacent residents and the local fire control authority must be notified prior to ignition.

9. Ash from the fire shall not be buried in the same trench used for your operating landfill. This is to prevent underground trash fires from becoming a problem in the landfill itself.

10. Ashes are considered a Group II waste, which are to be disposed of properly in a licensed Class II landfill.

11. Any public nuisance resulting from this open burning will be cause for revocation of this permit. The fire must be extinguished immediately if it is determined by the division to be a public nuisance.

12. Issuance of this permit does not release the operator from liability for impacts from this burn.

Sincerely,

Jeff Bellino
Air Quality Specialist

JB:jab

Enclosure

cc: Stillwater County Sanitarian
Waste Management Division

General Conditions
City of Big Timber
LF-507

A. Inspection

The recipient shall allow the department's representatives access to the source at all reasonable times for the purpose of making inspections, surveys, collecting samples, obtaining data, and otherwise conducting all necessary functions related to this permit.

B. Waiver

The permit and all the terms, conditions, and matters stated herein shall be deemed accepted if the recipient accepts the permit.

C. Compliance with Statutes and Regulations

Specific listing of requirements, limitations, and conditions contained herein doses not relieve the applicant from compliance with all applicable statutes and administrative regulations including amendments thereto, nor waive the right of the department to require compliance with all applicable statutes and administrative regulations, including amendments thereto.

D. Enforcement

Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties or other enforcement as specified in Section 75-2-401, MCA.

E. Application Data

Information submitted on behalf of an air quality permit application is hereby incorporated as a condition of that permit including commencement and completion dates of construction.

F. Permit Inspection

As required by ARM 16.8.1115 Inspection of Permit, a copy of the air quality permit shall be made available for inspection by department personnel at the location of the permitted source.

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
AIR QUALITY BUREAU

COGSWELL BUILDING
1400 BROADWAY

STATE OF MONTANA

(406) 444-3454
FAX (406) 444-1374

PO BOX 200901
HELENA, MONTANA 59620-0901

July 20, 1994

Jim W ✓
Lana
File: Sweet Grass
Big Timber #308

Ron Thomas
City of Big Timber
P.O. Box 416
Big Timber, MT 59011

Dear Mr. Thomas:

Air Quality Open Burning Permit #LF-475, issued by the Department of Health and Environmental Sciences, is now final. Burning may take place on days of good ventilation until August 19, 1994. If the burn has not occurred as of August 19, 1994, a new permit will need to be issued.

Sincerely,

Adel Johnson

Adel Johnson
Environmental Engineer

AJ:tjl

cc: Sweetgrass County Sanitarian
Solid and Hazardous Waste Bureau

RECEIVED
JUL 21 1994
NTANA DEPARTMENT OF HEALT
ENVIRONMENTAL SCIEN

"AN EQUAL OPPORTUNITY EMPLOYER"

File
Sweetgrass Co.
Big Timber
L.F.

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
AIR QUALITY BUREAU

COGSWELL BUILDING
1400 BROADWAY

STATE OF MONTANA

(406) 444-3454
FAX (406) 444-1374

PO BOX 200901
HELENA, MONTANA 59620-0901

July 5, 1994

RECEIVED
JUL 07 1994
MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES

Ron Thomas
City of Big Timber
P.O. Box 416
Big Timber, MT 59011

Dear Mr Thomas: RE: Permit #LF-475

Your landfill open burning permit application to burn untreated wood waste has been approved, and has been given permit #LF-475. This permit shall become final on July 20, 1994 unless the department's final decision is appealed to the Board of Health and Environmental Sciences. The burn is subject to the following conditions:

1. Burning will occur after the permit becomes final.

2. Burning will take place on days of good ventilation. Call 444-3454 for the ventilation forecast prior to ignition. The bureau will give permission for the burn by 8 a.m. on the date of the burn, if ventilation is adequate.

3. Adequate fire control will be present at all times and is the responsibility of the person or persons lighting the fire.

4. The fire must be completely extinguished at the end of the day. No smoking piles will be allowed overnight.

5. Only untreated wood waste may be burned. Prohibited items must be removed from the pile prior to ignition. The pile shall be free of dirt and contaminants which retard combustion.

6. This permit is good for a single burn only. The actual burn date is left up to the landfill operator; however, you must notify the Air Quality Bureau of the date selected (telephone 444-3454). This may be done at the same time you call for the ventilation forecast. The Sweetgrass County Sanitarian must also be notified prior to the burn.

7. **This permit expires August 19, 1994.** If the burn has not occurred as of this date, a new permit will need to be issued.

8. Adjacent residents and the local fire control authority must be notified prior to ignition.

9. Ash from the fire shall not be buried in the same trench used for your operating landfill. This is to prevent underground trash fires from becoming a problem in the landfill itself.

10. Ashes are considered a Group II waste, which are to be disposed of properly in a licensed Class II landfill.

11. Any public nuisance resulting from this open burning will be cause for revocation of this permit. The fire must be extinguished immediately if it is determined by the bureau to be a public nuisance.

12. Issuance of this permit does not release the operator from liability for impacts from this burn.

Sincerely,

Adel Johnson
Environmental Engineer

AJ:tjl

Enclosure

cc: Sweetgrass County Sanitarian
Solid and Hazardous Waste Bureau

General Conditions
City of Big Timber
LF-475

A. Inspection

The recipient shall allow the department's representatives access to the source at all reasonable times for the purpose of making inspections, surveys, collecting samples, obtaining data, and otherwise conducting all necessary functions related to this permit.

B. Waiver

The permit and all the terms, conditions, and matters stated herein shall be deemed accepted if the recipient accepts the permit.

C. Compliance with Statutes and Regulations

Specific listing of requirements, limitations, and conditions contained herein doses not relieve the applicant from compliance with all applicable statutes and administrative regulations including amendments thereto, nor waive the right of the department to require compliance with all applicable statutes and administrative regulations, including amendments thereto.

D. Enforcement

Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties or other enforcement as specified in Section 75-2-401, MCA.

E. Application Data

Information submitted on behalf of an air quality permit application is hereby incorporated as a condition of that permit including commencement and completion dates of construction.

F. Permit Inspection

As required by ARM 16.8.1115 Inspection of Permit, a copy of the air quality permit shall be made available for inspection by department personnel at the location of the permitted source.

File: Sweet grass Co.

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
AIR QUALITY BUREAU

COGSWELL BUILDING
1400 BROADWAY

STATE OF MONTANA

(406) 444-3454
FAX (406) 444-1374

PO BOX 200901
HELENA, MONTANA 59620-0901

November 5, 1993

Gene Langhus
City of Big Timber
P.O. Box 416
Big Timber, MT 59011

Dear Mr. Langhus:

Air Quality Open Burning Permit #LF-452, issued by the Department of Health and Environmental Sciences, is now final. Burning may take place on days of good ventilation until November 30, 1993. If the burn has not occurred as of November 30, 1993, a new permit will need to be issued.

Sincerely,

David L Klemp

David L. Klemp
Environmental Engineer

DK:tjl

cc: Sweet Grass County Sanitarian
Solid and Hazardous Waste Bureau

Sweet Grass Co.

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
AIR QUALITY BUREAU

COGSWELL BUILDING
1400 BROADWAY

STATE OF MONTANA

(406) 444-3454
FAX (406) 444-1374

PO BOX 200901
HELENA, MONTANA 59620-0901

October 21, 1993

RECEIVED
OCT 22 1993
MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID AND HAZARDOUS WASTE BUREAU

Gene Langhus
City of Big Timber
P.O. Box 416
Big Timber, MT 59011

Dear Mr. Langhus: RE: Permit #LF-452

Your landfill open burning permit application to burn untreated wood waste has been approved, and has been given permit #LF-452. This permit shall become final on November 5, 1993 unless the department's final decision is appealed to the Board of Health and Environmental Sciences. The burn is subject to the following conditions:

1. Burning will occur after the permit becomes final.

2. Burning will take place on days of good ventilation. Call 444-3454 for the ventilation forecast prior to ignition. The bureau will give permission for the burn by 8 a.m. on the date of the burn, if ventilation is adequate.

3. Adequate fire control will be present at all times and is the responsibility of the person or persons lighting the fire.

4. **The fire must be completely extinguished at the end of the day. No smoking piles will be allowed overnight.**

5. Only untreated wood waste may be burned. Prohibited items must be removed from the pile prior to ignition. The pile shall be free of dirt and contaminants which retard combustion.

6. This permit is good for a single burn only. The actual burn date is left up to the landfill operator; however, you must notify the Air Quality Bureau of the date selected (telephone 444-3454). This may be done at the same time you call for the ventilation forecast. The Sweet Grass County Sanitarian must also be notified prior to the burn.

7. **This permit expires November 30, 1993.** If the burn has not occurred as of this date, a new permit will need to be issued.

"AN EQUAL OPPORTUNITY EMPLOYER"

8. Adjacent residents and the local fire control authority must be notified prior to ignition.

9. Ash from the fire shall not be buried in the same trench used for your operating landfill. This is to prevent underground trash fires from becoming a problem in the landfill itself.

10. Ashes are considered a Group II waste, which are to be disposed of properly in a licensed Class II landfill.

11. Any public nuisance resulting from this open burning will be cause for revocation of this permit. The fire must be extinguished immediately if it is determined by the bureau to be a public nuisance.

12. Issuance of this permit does not release the operator from liability for impacts from this burn.

Sincerely,

David L Klemp

David L. Klemp
Environmental Engineer

DK:tjl

Enclosure

cc: Sweet Grass County Sanitarian
Solid and Hazardous Waste Bureau

General Conditions
City of Big Timber
LF-452

A. Inspection

The recipient shall allow the department's representatives access to the source at all reasonable times for the purpose of making inspections, surveys, collecting samples, obtaining data, and otherwise conducting all necessary functions related to this permit.

B. Waiver

The permit and all the terms, conditions, and matters stated herein shall be deemed accepted if the recipient accepts the permit.

C. Compliance with Statutes and Regulations

Specific listing of requirements, limitations, and conditions contained herein doses not relieve the applicant from compliance with all applicable statutes and administrative regulations including amendments thereto, nor waive the right of the department to require compliance with all applicable statutes and administrative regulations, including amendments thereto.

D. Enforcement

Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties or other enforcement as specified in Section 75-2-401, MCA.

E. Application Data

Information submitted on behalf of an air quality permit application is hereby incorporated as a condition of that permit including commencement and completion dates of construction.

F. Permit Inspection

As required by ARM 16.8.1115 Inspection of Permit, a copy of the air quality permit shall be made available for inspection by department personnel at the location of the permitted source.

SHWB
Sweet Grass

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
AIR QUALITY BUREAU

COGSWELL BUILDING
1400 BROADWAY

STATE OF MONTANA

(406) 444-3454
FAX (406) 444-1374

PO BOX 200901
HELENA, MONTANA 59620-0901

April 21, 1993

Kevin Hutchins
City of Big Timber
P.O. Box 416
Big Timber, MT 59011

Dear Mr. Hutchins:

Air Quality Open Burning Permit #LF-427, issued by the Department of Health and Environmental Sciences, is now final. Burning may take place on days of good ventilation until May 21, 1993. If the burn has not occurred as of May 21, 1993, a new permit will need to be issued.

Sincerely,

David L. Klemp
Environmental Engineer

DK:tjl

RECEIVED
APR 22 1993
MONTANA DEPARTMENT OF [illegible]
AND ENVIRONMENTAL [illegible]

[illegible]
File SHWB
BAC

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
AIR QUALITY BUREAU

COGSWELL BUILDING
1400 BROADWAY

STATE OF MONTANA

(406) 444-3454
FAX (406) 444-1374

PO BOX 200901
HELENA, MONTANA 59620-0901

April 6, 1993

RECEIVED

APR 0 7 1993

NTANA DEPARTMENT OF HEAL
AND ENVIRONMENTAL SCIENC
R5

Kevin Hutchins
City of Big Timber
P.O. Box 416
Big Timber, MT 59011

Dear Mr. Hutchins: RE: Permit #LF-427

Your landfill open burning permit application to burn untreated wood waste has been approved, and has been given permit #LF-427. This permit shall become final on April 21, 1993 unless the department's final decision is appealed to the Board of Health and Environmental Sciences. The burn is subject to the following conditions:

1. Burning will occur after the permit becomes final.

2. Burning will take place on days of good ventilation. Call 444-3454 for the ventilation forecast prior to ignition. The bureau will give permission for the burn by 8 a.m. on the date of the burn, if ventilation is adequate.

3. Adequate fire control will be present at all times and is the responsibility of the person or persons lighting the fire.

4. **The fire must be completely extinguished at the end of the day. No smoking piles will be allowed overnight.**

5. Only untreated wood waste may be burned. Prohibited items must be removed from the pile prior to ignition. The pile shall be free of dirt and contaminants which retard combustion.

6. This permit is good for a single burn only. The actual burn date is left up to the landfill operator; however, you must notify the Air Quality Bureau of the date selected (telephone 444-3454). This may be done at the same time you call for the ventilation forecast. The Sweet Grass County Sanitarian must also be notified prior to the burn.

7. **This permit expires May 21, 1993.** If the burn has not occurred as of this date, a new permit will need to be issued.

8. Adjacent residents and the local fire control authority must be notified prior to ignition.

9. Ash from the fire shall not be buried in the same trench used for your operating landfill. This is to prevent underground trash fires from becoming a problem in the landfill itself.

10. Ashes are considered a Group II waste, which are to be disposed of properly in a licensed Class II landfill.

11. Any public nuisance resulting from this open burning will be cause for revocation of this permit. The fire must be extinguished immediately if it is determined by the bureau to be a public nuisance.

12. Issuance of this permit does not release the operator from liability for impacts from this burn.

Sincerely,

David L. Klemp
Environmental Engineer

DK:tjl

Enclosure

cc: Sweet Grass County Sanitarian
Solid and Hazardous Waste Bureau

General Conditions
City of Big Timber
LF-427

A. Inspection

The recipient shall allow the department's representatives access to the source at all reasonable times for the purpose of making inspections, surveys, collecting samples, obtaining data, and otherwise conducting all necessary functions related to this permit.

B. Waiver

The permit and all the terms, conditions, and matters stated herein shall be deemed accepted if the recipient accepts the permit.

C. Compliance with Statutes and Regulations

Specific listing of requirements, limitations, and conditions contained herein doses not relieve the applicant from compliance with all applicable statutes and administrative regulations including amendments thereto, nor waive the right of the department to require compliance with all applicable statutes and administrative regulations, including amendments thereto.

D. Enforcement

Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties or other enforcement as specified in Section 75-2-401, MCA.

E. Application Data

Information submitted on behalf of an air quality permit application is hereby incorporated as a condition of that permit including commencement and completion dates of construction.

F. Permit Inspection

As required by ARM 16.8.1115 Inspection of Permit, a copy of the air quality permit shall be made available for inspection by department personnel at the location of the permitted source.

File: Sweetgrass Co

RECEIVED
SEP 30 1992
MONTANA DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES
SOLID AND HAZARDOUS WASTE BUREAU

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

AIR QUALITY BUREAU

STAN STEPHENS, GOVERNOR
COGSWELL BUILDING

STATE OF MONTANA

(406) 444-3454
FAX # (406) 444-1374
HELENA, MONTANA 59620

September 29, 1992

Gene Langhus
City of Big Timber
P.O. Box 416
Big Timber, MT 59011

Dear Mr.Langhus: RE: Permit #LF-404

Your landfill open burning permit application to burn untreated wood waste has been approved, and has been given permit #LF-404. This permit shall become final on October 14, 1992 unless the department's final decision is appealed to the Board of Health and Environmental Sciences. The burn is subject to the following conditions:

1. Burning will occur after the permit becomes final.

2. Burning will take place on days of good ventilation. Call 444-3454 for the ventilation forecast prior to ignition. The bureau will give permission for the burn by 8 a.m. on the date of the burn, if ventilation is adequate.

3. Adequate fire control will be present at all times and is the responsibility of the person or persons lighting the fire.

4. **The fire must be completely extinguished at the end of the day. No smoking piles will be allowed overnight.**

5. Only untreated wood waste may be burned. Prohibited items must be removed from the pile prior to ignition. The pile shall be free of dirt and contaminants which retard combustion.

6. This permit is good for a single burn only. The actual burn date is left up to the landfill operator; however, you must notify the Air Quality Bureau of the date selected (telephone 444-3454). This may be done at the same time you call for the ventilation forecast. The Sweet Grass County Sanitarian must also be notified prior to the burn.

7. **This permit expires November 13, 1992.** If the burn has not occurred as of this date, a new permit will need to be issued.

"AN EQUAL OPPORTUNITY EMPLOYER"

8. Adjacent residents and the local fire control authority must be notified prior to ignition.

9. Ash from the fire shall not be buried in the same trench used for your operating landfill. This is to prevent underground trash fires from becoming a problem in the landfill itself.

10. Ashes are considered a Group II waste, which are to be disposed of properly in a licensed Class II landfill.

11. Any public nuisance resulting from this open burning will be cause for revocation of this permit. The fire must be extinguished immediately if it is determined by the bureau to be a public nuisance.

12. Issuance of this permit does not release the operator from liability for impacts from this burn.

Sincerely,

John Ruth
Environmental Specialist II

JR:tjl

Enclosure

cc: County Sanitarian
Solid and Hazardous Waste Bureau

SECTION III. General Conditions

A. Inspection

The recipient shall allow the department's representatives access to the source at all reasonable times for the purpose of making inspections, surveys, collecting samples, obtaining data, and otherwise conducting all necessary functions related to this permit.

B. Waiver

The permit and all the terms, conditions, and matters stated herein shall be deemed accepted if the recipient accepts the permit.

C. Compliance with Statutes and Regulations

Specific listing of requirements, limitations, and conditions contained herein doses not relieve the applicant from compliance with all applicable statutes and administrative regulations including amendments thereto, nor waive the right of the department to require compliance with all applicable statutes and administrative regulations, including amendments thereto.

D. Enforcement

Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties or other enforcement as specified in Section 75-2-401, MCA.

E. Application Data

Information submitted on behalf of an air quality permit application is hereby incorporated as a condition of that permit including commencement and completion dates of construction.

F. Permit Inspection

As required by ARM 16.8.1115 Inspection of Permit, a copy of the air quality permit shall be made available for inspection by air quality personnel at the location of the permitted source.

SHWB

File:
Sweet Grass
Big T. L.

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

AIR QUALITY BUREAU

STAN STEPHENS, GOVERNOR

COGSWELL BUILDING

STATE OF MONTANA

(406) 444-3454
FAX # (406) 444-1374

HELENA, MONTANA 59620

June 17, 1992

RECEIVED

JUN 1 8 1992

MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID AND HAZARDOUS WASTE BUREAU

Kevin J. Hutchins
City of Big Timber
P. O. Box 416
Big Timber, MT 59011

Dear Mr. Hutchins:

RE: Permit #LF-391

Your landfill open burning permit application to burn untreated wood waste has been approved, and has been given permit #LF-391. This permit shall become final on July 2, 1992 unless the department's final decision is appealed to the Board of Health and Environmental Sciences. The burn is subject to the following conditions:

1. Burning will occur after the permit becomes final.

2. Burning will take place on days of good ventilation. Call 444-3454 for the ventilation forecast prior to ignition. The bureau will give permission for the burn by 8 a.m. on the date of the burn, if ventilation is adequate.

3. Adequate fire control will be present at all times and is the responsibility of the person or persons lighting the fire.

4. The fire must be completely extinguished at the end of the day. No smoking piles will be allowed overnight.

5. Only untreated wood waste may be burned. Prohibited items must be removed from the pile prior to ignition. The pile shall be free of dirt and contaminants which retard combustion.

6. This permit is good for a single burn only. The actual burn date is left up to the landfill operator; however, you must notify the Air Quality Bureau of the date selected (telephone 444-3454). This may be done at the same time you call for the ventilation forecast. The Sweet Grass County Sanitarian must also be notified prior to the burn.

7. This permit expires August 1, 1992. If the burn has not occurred as of this date, a new permit will need to be issued.

8. Adjacent residents and the local fire control authority must be notified prior to ignition.

9. Ash from the fire shall not be buried in the same trench used for your operating landfill. This is to prevent underground trash fires from becoming a problem in the landfill itself.

10. Ashes are considered a Group II waste, which are to be disposed of properly in a licensed Class II landfill.

11. Any public nuisance resulting from this open burning will be cause for revocation of this permit. The fire must be extinguished immediately if it is determined by the bureau to be a public nuisance.

12. Issuance of this permit does not release the operator from liability for impacts from this burn.

Sincerely,

Catherine Quiñones

Catherine Quiñones
Environmental Engineer

CQ:kmj

Enclosure

cc: County Sanitarian
Solid and Hazardous Waste Bureau

Sweetgrass Co - Big Tim
LF

SHWB

Jim W

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
AIR QUALITY BUREAU

STAN STEPHENS, GOVERNOR **COGSWELL BUILDING**

STATE OF MONTANA

HELENA, MONTANA 59620

(406) 444-3454
FAX # (406) 444-1374

RECEIVED
RCS
MAR 20 1992
MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID AND HAZARDOUS WASTE BUREAU

March 17, 1992

Gene Langhus
City of Big Timber
P.O. Box 416
Big Timber, MT 59011

Dear Mr. Langhus: RE: Permit #LF-377

Your landfill open burning permit application to burn untreated wood waste has been approved, and has been given permit #LF-377. This permit shall become final on April 1, 1992 unless the department's final decision is appealed to the Board of Health and Environmental Sciences. The burn is subject to the following conditions:

1. Burning will occur after the permit becomes final.

2. Burning will take place on days of good ventilation. Call 444-3454 for the ventilation forecast prior to ignition. The bureau will give permission for the burn by 8 a.m. on the date of the burn, if ventilation is adequate.

3. Adequate fire control will be present at all times and is the responsibility of the person or persons lighting the fire.

4. **The fire must be completely extinguished at the end of the day. No smoking piles will be allowed overnight.**

5. Only untreated wood waste may be burned. Prohibited items must be removed from the pile prior to ignition. The pile shall be free of dirt and contaminants which retard combustion.

6. This permit is good for a single burn only. The actual burn date is left up to the landfill operator; however, you must notify the Air Quality Bureau of the date selected (telephone 444-3454). This may be done at the same time you call for the ventilation forecast. The Stillwater County Sanitarian must also be notified prior to the burn.

7. **This permit expires April 30, 1992**. If the burn has not occurred as of this date, a new permit will need to be issued.

8. Adjacent residents and the local fire control authority must be notified prior to ignition.

9. Ash from the fire shall not be buried in the same trench used for your operating landfill. This is to prevent underground trash fires from becoming a problem in the landfill itself.

10. Ashes are considered a Group II waste, which are to be disposed of properly in a licensed Class II landfill.

11. Any public nuisance resulting from this open burning will be cause for revocation of this permit. The fire must be extinguished immediately if it is determined by the bureau to be a public nuisance.

12. Issuance of this permit does not release the operator from liability for impacts from this burn.

Sincerely,

Catherine Quiñones

Catherine Quiñones
Environmental Engineer

CQ:tjl

Enclosure

cc: County Sanitarian
Solid and Hazardous Waste Bureau

GENERAL CONDITIONS

A. Inspection

The recipient shall allow the department's representatives access to the source at all reasonable times for the purpose of making inspections, surveys, collecting samples, obtaining data, and otherwise conducting all necessary functions related to this permit.

B. Waiver

The permit and all the terms, conditions, and matters stated herein shall be deemed accepted if the recipient accepts the permit.

C. Compliance with Statutes and Regulations

Specific listing of requirements, limitations, and conditions contained herein doses not relieve the applicant from compliance with all applicable statutes and administrative regulations including amendments thereto, nor waive the right of the department to require compliance with all applicable statutes and administrative regulations, including amendments thereto.

D. Enforcement

Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties or other enforcement as specified in Section 75-2-401, MCA.

E. Application Data

Information submitted on behalf of an air quality permit application is hereby incorporated as a condition of that permit including commencement and completion dates of construction.

F. Permit Inspection

As required by ARM 16.8.1115 Inspection of Permit, a copy of the air quality permit shall be made available for inspection by air quality personnel at the location of the permitted source.

DEPARTMENT OF ENVIRONMENTAL QUALITY
PERMITTING & COMPLIANCE DIVISION
Community Services Bureau
Waste Management Section
MARC RACICOT, GOVERNOR

STATE OF MONTANA

Phone: (406) 444-4400
Fax: (406) 444-1374

Metcalf Building
1520 E Sixth Ave
PO Box 200901
Helena, MT 59620-0901

MAILED
3/1/99 ND

County Sweet Grass
Facility & # Big Timber
Closure
Finan Assur
GW Corr Meas
GW Monitoring
GW Reports
Inspections
Other:

Landfarm
Liner
Methane
O & M
Run - On

March 1, 1999

Frank Laverell
Laverell's Septic
P.O. Box 1253
Big Timber, MT 59011-1253

Dear Frank:

Thank you for your phone call. In answer to your question, the use of part of the closed Big Timber Landfill as a septage land application site would be acceptable. Landfill closure regulations require that the cap be protected, but any other portions of the site would be acceptable to the Department. The application of septage to the cap prior to tillage and planting, would also be acceptable.

Site inspection and approval from the County Sanitarian would still be necessary, as per State statutes.

If I can be of further help in this matter, please feel free to contact me. My direct phone line is 406-444-5294.

Sincerely,

F Patrick Crowley

F. Patrick Crowley
Acting Waste Management Section Supervisor

cc: Town Of Big Timber

File: Laverell's Septic and Big Timber closure.
Path: CSB temp/laverells

Post-it® Fax Note 7671	Date 3/1/99 # of pages ▶ 1
To TOWN OF BIG TIMBER	From PAT CROWLEY
Co./Dept.	Co. DEQ
Phone #	Phone # (406) 444-5294
Fax # (406) 932-5611	Fax # (406) 444-1374

587 ND.

Sweet Grass Co. file

OFFICE MEMORANDUM

MONTANA DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES, SOLID & HAZARDOUS WASTE BUREAU

TO: Steve Pilcher;
Bob Robinson

DATE: April 14, 1994

FROM: Roger Thorvilson

SUBJECT: Legislative Contacts -- Senator Grosfield

I have been contacted twice by Senator Grosfield relative to his interest in solid waste issues as they pertain to Big Timber. He is currently pursuing the issue of the small community exemption for municipal solid waste landfills and how it was developed and written by the EPA and by DHES.

He indicated that he may possibly introduce legislation in 1995 to address this issue. I do not really know yet what form a bill might take.

mailed 4-15-94 en

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
Solid and Hazardous Waste Bureau
Waste Management Section
406/444-1430
MARC RACICOT, GOVERNOR
FAX # (406) 444-1499
STATE OF MONTANA
OFFICE LOCATION 836 Front Street Helena, Montana
MAILING ADDRESS: PO BOX 200901 Helena, MT 59620-0901

April 14, 1994

Lorents Grosfield
Senate District 41
HC 87, Box 2145
Big Timber, MT 59011

Dear Senator Grosfield:

I have enclosed portions of the background information which you inquired about relative to our administrative rules on solid waste management and the small community exemption. Pat Crowley reviewed the office files and selectively copied the most pertinent documents. He elected not to copy the entire file, as it is rather extensive.

After you have had an opportunity to peruse the enclosed information, please feel free to call Pat, Jon or me with questions or to request additional file information that you may need.

Sincerely,

Roger Thorvilson

Roger C. Thorvilson
Acting Bureau Chief

encl.

Solid and Hazardous Waste Bureau
836 Front Street, Helena, MT 59620
Phone (406) 444-1430

MEMORANDUM

TO: **Roger Thorvilson**

FROM: **F. P. Crowley**

SUBJECT: **Rule Adoption, 1993 Solid Waste Rules**

DATE: **April 14, 1994**

Attached please find the documentation you requested on the 1993 rule making process for the Solid Waste Program EPA approval.

The 1991 Legislature passed 18 new laws influencing solid waste management in anticipation of the final rulemaking of Subtitle D by the EPA. The flexibilities allowed by the EPA in "approved States" was considered highly desirable for Montana landfills.

Accordingly, the Solid Waste Program was expanded in late summer of 1991 to handle the backlog of pending landfill applications, the new ground water rules mandated by the 1989 Legislature and in anticipation of the EPA rules. On October 9, 1993 the EPA published the Subtitle D rules and gave the states two years to gain program approval and landfills the same two years to come into compliance with the self-implementing Federal rules. (Enforcement on the Federal level is through RCRA citizen suits, not directly by the EPA.)

I was tasked to the general rule revision project in March, 1992 as part of my duties as Regulatory Lead. Jon Dilliard (Program Manager) decided that we would all benefit from a broad based review of our proposed rules in the staff draft stages so he set up the Blue Ribbon Steering Committee. I have attached the first pages of the minutes for the four meetings held between November 1992 and April 1993. These pages will give you an idea of the membership of the committee.

A preliminary draft of the rules was submitted to the EPA for review in February, 1993. Comments from the EPA, Blue Ribbon Committee reviewers, Solid Waste staff and Program legal council were incorporated into the final draft of the rules. On May 13, 1993 the proposed rule was published in the ARM.

The proposed rule was mailed to all license holders, County Commissioners offices, MACO, MLCT, solid waste consulting firms, and concerned environmental groups and citizens. About 250 copies total were sent out. A public hearing was held on June 2, 1993. A transcript of the hearing is attached. The Department's notice of adoption and amendment (with replies to comments) was adopted July 29, 1993. (Attached.)

On July 28, 1993 the EPA proposed delaying implementation of parts of their new rule for smaller landfills. A final rule was published in the Federal Register on October 1, 1993. The Department responded with a proposed rule on September 16, 1993, a public hearing on October 6, 1993, and a final rule making on November 10, 1994. Same mailing list and contacts.

The EPA also noted some technical corrections during the program approval process. These required revisions were published on September 30, 1993, with a public hearing on October 20, 1993 and final rule on November 24, 1993.

Final Program Approval by the EPA was published in the Federal Register on December 21, 1993.

I will be in all next week if you have any more questions on this.

Pat

Sweet Grass

ROUTE SLIP

DEPARTMENT OF HEALTH & ENVIRONMENTAL SCIENCES

TO: Proob JH

DATE: 4/11/94

1. Pat C.
2. Jon JD
3. Roger pcb

☑ Approval
☐ Note and Return
☐ Prepare reply
☐ As requested

☑ Comment
☐ Note and File
☐ Signature
☐ For your information

☐ Necessary Action
☐ Investigate
☐ See Me
☐ Per Conversation

REMARKS:

Please file in Sweet Grass/
Big Timber Class II Landfill

FROM: Lara D

mailed
4-13-94
eh

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
Solid and Hazardous Waste Bureau
Solid Waste Program
MARC RACICOT, GOVERNOR 406/444-1430 FAX # (406) 444-1499

STATE OF MONTANA

OFFICE LOCATION 836 Front Street
Helena, Montana

MAILING ADDRESS: PO BOX 200901
Helena, MT 59620-0901

April 12, 1994

Mayor James A. Devenny
City of Big Timber
P.O. Box 416
Big Timber, Montana 59011

SUBJECT: Request for Information

Dear Mayor Devenny:

Thank you for contacting this office. Enclosed you will find the information you requested concerning solid waste disposal districts and the status of all Class II landfills in Montana. The 8½ by 14 inch set of papers lists all the licensed (and unlicensed) solid waste management facilities in Montana as of February 23, 1994. I have highlighted the solid waste disposal districts for your reference in yellow. In regards to the status of the state's Class II landfills, I have enclosed an updated computer generated list of landfills, by county, and have indicated whether or not they will be open or closed after April 8, 1994. The solid waste management facility listing has the contact person listed and their address in case you desire to contact a facility. This particular list cannot be duplicated and given out to the public for solicitation purposes according to Section 2-6-109, Montana Code Annotated.

If you have any questions or comments on the enclosed information, please feel free to contact me.

Sincerely,

Lara M. Dando

Lara M. Dando
Solid and Hazardous Waste Specialist

Enclosures: SWMF Listing, Class II Status Listing

CB5405\WP\LETTERS.94\GENERAL.INF\BIGTIMBR.411

"AN EQUAL OPPORTUNITY EMPLOYER"

BIG TIMBER LANDFILL

ALTERNATIVES ANALYSIS SUMMARY

Jim Wilbur

February 17, 1994

PREPARED BY

DAMSCHEN & ASSOCIATES, INC.
Helena, Montana

TABLE 1

EXISTING BIG TIMBER LANDFILL
CAPITAL COST ESTIMATES

ITEM	ALTERNATIVE	
	CONTINUE TO USE LANDFILL	CLOSE LANDFILL PRIOR TO 4/9/94
EXPENSES		
1. Fill Existing Trench and Recontour Site	-	$8,000
2. Apply Final Cover & Final Blading	Incl. Table 2	2,000
3. Provide Vegetative Cover	Incl. Table 2	2,000
4. Install Methane Monitoring System	4,000	-
5. Construct Building	24,000	-
6. Contingency (10%)	3,000	1,000
Subtotal - Costs	31,000	13,000
LESS SALVAGE VALUE		
1. Sell Track Loader	-	70,000
2. Sell Building Package	-	10,000
Subtotal - Salvage	-	$80,000
Net Capital Cost (Profit)	$31,000	($67,000)
Amortization (20 yrs - 7%)	$3,400	($7,400)

TABLE 2

EXISTING BIG TIMBER LANDFILL
ESTIMATED OPERATING & POST CLOSURE COSTS

already budgeted

not budgeted yet

Current budget @ $128,880 a years

ITEM	ANNUAL COST
ANNUAL OPERATION COSTS	
1. Operating Cost	86,000 (1)
2. Equipment Depreciation	6,000
3. Existing Bond Repayment	38,000 *
4. Periodic Trench Excavation	2,000
5. Monitoring Well Testing	10,000
6. Methane Monitoring	1,000
7. Utilities	1,000
8. Final Closing & Seeding	1,000
9. Contingency (10%)	10,000
TOTAL	$155,000
POST CLOSURE COSTS (FOR 30 YEARS AFTER CLOSURE)	
Groundwater Monitoring	10,000
Methane Monitoring	1,000
Annual Inspections & Update Plan	2,000
Cap Maintenance	1,000
TOTAL ANNUAL COST	$14,000
TOTAL COST FOR 30 YEARS	$420,000

- Test for heavy metals -

- doesn't include closure.

- cost if landfill used after April 9.

(1) Based on 2/3 of total sanitation operating budget.

TABLE 3

COMBINATION ROLL-OFF/CLASS III SITE
CAPITAL AND ANNUAL COSTS
(Open 2 Days/Wk)

ITEM	TOTAL
CAPITAL COST	
Concrete Construction	60,000
Site Screening	50,000
Earthwork & Gravel	10,000
State Permit Review Fee	3,000
Engineering & Contingency (25%)	31,000
TOTAL CAPITAL COST	$154,000
ANNUAL COST	
Existing Bond Payment	38,000
Amortization of Capital (20 yrs - 7%)	17,000
Container Amortization ($16,000 @ 7% - 10 Yrs)	2,500
Gate Attendant (6 hrs/wk)	3,100
Periodic Trench Maintenance (Class III)	1,500
Maintenance of Containers	1,500
Annual State Permit Fee (Class III)	1,000
Contingency (10%)	6,500
TOTAL ANNUAL FACILITY COST	$71,100

Located at
existing landfill
can use
pit @ of
end for
Class II
Branches
grass -
Big T.
Currentl
Class II.

TABLE 4

BIG TIMBER LANDFILL
ALTERNATIVES ANALYSIS ANNUAL SYSTEM DISPOSAL COST SUMMARY

COST COMPONENT	ALTERNATIVE				
	USE EXISTING LANDFILL		ROLLOFF/CLASS III SYSTEM		
	WITH EXEMPTION	WITHOUT EXEMPTION	TO LEWISTOWN	TO LOGAN	TO BILLINGS
1. Landfill Capital Amortization	3,400	3,400	(7,400)	(7,400)	(7,400)
2. Landfill Operation	155,000	155,000	-	-	-
3. Landfill Post Closure(1)	8,400	8,400	-	-	-
4. Landfill Financial Assurance(2) Iffy -	12,600	12,600	-	-	-
5. Landfill Liner(3)	-	31,500	-	-	-
6. Landfill Drop Charge(4)	-	-	75,000	42,000	12,000
7. Container/Class III Site	-	-	71,000	71,000	71,000
8. Transfer Cost(5)	-	-	78,000	85,000	82,000
TOTAL ANNUAL DISPOSAL COST	**$179,400**	**$210,900**	**$216,600**	**$190,600**	**$157,600**
COST PER EQUIVALENT UNIT/YR(6)	**$132.88**	**$156.22**	**$160.44**	**$141.85**	**116.74**

(1) Based on landfill life of 50 years.
(2) Based on 3% per year.
(3) Based on $100,000/acre on bottom and $50,000/acre on top.
(4) Based on drop charge of $50/Ton to Lewistown, $28/Ton to Logan and $8/Ton to Billings (1,500 Tons per year).
(5) Based on $2.50 per running mile and hauling 8 tons per trip (2 containers per trip).
(6) Based on 1,350 equivalent residential units ($199,500 revenue ÷ $148/Unit/Yr)

3 & 4 go into effect a year from now -
Barry - 50-50 chance 4 could be $0.

TABLE 5

BIG TIMBER LANDFILL ALTERNATIVES ANALYSIS COST SUMMARY

ITEM	USE EXISTING LANDFILL		USE ROLLOFF/CLASS III		
	WITH EXEMPT	W/O EXEMPT	TO LEWISTOWN	TO LOGAN	TO BILLINGS
Total Annual Disposal Cost	$179,400	$210,900	$216,600	$190,600	$157,600
Additional Cost for Collection	$43,300	$43,300	$43,300	$43,300	$43,300
TOTAL ANNUAL COST	$222,700	$254,200	$259,900	$233,900	$200,900
% Increase from Existing Rates (1)	11.6%	27.4%	30.3%	17.2%	0.7%

1) Based on existing fees of $199,500/YR.

Sweet Grass

ROUTE SLIP

DEPARTMENT OF HEALTH & ENVIRONMENTAL SCIENCES

TO: Proof ltr DATE: 1/19/92

1. Jim or Pat PR
2. Jon JP 4. Duane DM
3. Roger RES 5) Don V DN

☑ Approval	☑ Comment	☐ Necessary Action
☐ Note and Return	☐ Note and File	☐ Investigate
☐ Prepare reply	☐ Signature	☐ See Me
☐ As requested	☐ For your information	☐ Per Conversation

REMARKS:

Please file under:

Sweet Grass County / City of Big Timber
Licensed Class II Landfill

Thank you.

FROM: Lara M. Dando

mailed
1-21-93
lh

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
Solid and Hazardous Waste Bureau
Solid Waste Program
(406) 444-1430
STAN STEPHENS, GOVERNOR
FAX #(406) 444-1499
STATE OF MONTANA
OFFICE LOCATION: 836 Front Street Helena, Montana
MAILING ADDRESS: Cogswell Building Helena, MT 59620

January 21, 1993

Kevin Hutchins
City of Big Timber
P.O. Box 416
Big Timber, Montana 59011

SUBJECT: Disposal Options for Used Oil and Oil Filters

Dear Mr. Hutchins:

I am writing to you in response to our January 19, 1993, telephone conversation concerning proper disposal methods for used oil filters and used oil. The following is a brief synopsis of the various options Montanans have at this time. If you have any questions on this information, please do not hesitate to contact me.

Current Regulatory Status of Used Oil

Used oil can be defined as any oil that has been refined from crude oil, used, and as a result of such use has been contaminated by physical and/or chemical impurities. While used oil itself is not currently a United States Environmental Protection Agency listed hazardous waste, it is still subject to state and federal hazardous waste regulation if it has been mixed with listed hazardous waste or if it exhibits any of the four hazardous waste characteristics (corrosive, ignitable, toxic, and/or reactive) **and is disposed of** rather than recycled. Used oil that has not been mixed with hazardous waste, such as solvents or fuels, **and is recycled** is not subject to state and federal hazardous waste regulations. Recycling may include reuse, re-refining, processing to produce fuels, or burning for energy recovery.

Management Options for Used Oil

Whenever possible, used oil should be recycled. In some cases, commercial filtration units may be used to filter hydraulic oils for reuse or to filter diesel crankcase oil for supplementing diesel fuel. Some businesses re-refine used oil for reuse or process used oil into a saleable fuel. I have included a list of used oil collectors and recyclers in Montana that may be of some help to you in deferring potential used oil depositors from your landfill.

Another option is to burn used oil in a space heater. A person may burn only used oil produced at his/her own business, received only from households, or received from a registered "used oil marketer" which has been demonstrated to meet certain quality specifications (such as pass a Toxicity Characteristic Leaching Procedure (TCLP) analysis).

A space heater may not exceed 500,000 Btu per hour capacity. Devices that meet the regulatory definition of industrial boilers and furnaces may burn all of the previously mentioned used oils as well as off-specification used oils.

The final option in Montana for managing used oil is to dispose of it. Household quantities of used oil are excluded from hazardous waste regulation. Consequently, do-it-yourselfers can legally dispose of used oil in a licensed Class II landfill at this time. All other oils should be considered to be a potentially hazardous waste if disposed of in a licensed Class II landfill or otherwise discarded or abandoned. That is unless demonstrated to be non-hazardous through appropriate laboratory analysis. The Montana Department of Health and Environmental Sciences recommends the reuse, re-refining, re-processing, or the burning for energy recovery of used oil. Landfilling should be your last option.

Current Regulatory Status of Used Oil Filters

In general, state and federal regulations do not regulate used oil filters as hazardous waste so long as all free-flowing oil has been removed from the filter. When used oil filters have been drained properly and they are not "terne plated", the filters should not exhibit toxic characteristics. Terne is an alloy of tin and lead used to plate some filters, and can cause the filter to exceed toxicity characteristic limits for lead. These filters are not exempt from state and federal hazardous waste regulations. However, if the generator produces less than approximately 220 pounds (100 kilograms) of used terne plated oil filters per calendar month (i.e. a conditionally exempt small quantity generator), he or she can legally dispose of their drained filters in a licensed Class II landfill.

Management Options for Used Oil Filters

Non-terne plated oil filters may be recycled or disposed of in a licensed Class II landfill without running a TCLP analysis, provided they are crushed or drained. The Department and EPA encourages the recycling of used oil filters when feasible.

I hope this information will help clarify the legal management options available in Montana for used oil and used oil filters. If you have any questions or comments, please do not hesitate to contact me.

Sincerely,

Lara M. Dando

Lara M. Dando
Environmental Specialist

Enclosures: Used Oil Fact Sheet, List of Recyclers/Collectors
larad\wp\letters.93\hazwaste\bigtimbr.119

MESSAGE CONFIRMATION

DATE:11/15/91 TIME:10:01

ID:SOLID & HAZARDOU

DATE	TIME	TX-TIME	DISTANT STATION ID	MODE	PAGES	RESULT
11/15	09:58	02'30"	14069325443	G3-S	004	OK

Montana Department of Health and Environmental Sciences
Solid and Hazardous Waste Bureau
Helena, MT 59620
Phone (406)444-~~1420~~ 1430
Fax # - (406)444-1499

Fax Cover Sheet

Date: 15 November 1991

Total Number of Pages, including cover sheet: 4

To: Gene Langhus
City of Big Timber

Fax No. 932 - 5443

Sent from: DHES / SHWB
Pat Crowley

RC# 2211

Comments:
Letter + Fee Calculation Sheet.

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

STAN STEPHENS, GOVERNOR

FAX #(406) 444-1499

STATE OF MONTANA

OFFICE LOCATION: 836 Front Street
Helena, Montana

MAILING ADDRESS: Cogswell Building
Helena, MT 59620

Solid and Hazardous Waste Bureau
(406) 444-1430

June 10, 1991

To: All Mayors
City and County Commissions
Solid Waste Management System License holders
Solid Waste Management System License applicants
Landfill Owners and Operators
County Sanitarians

Subject: Solid Waste Fees

The 1991 Montana State Legislature passed Senate Bill 209, which was signed into law by the Governor in April. The bill is entitled: "*An act to require a solid waste management system to be licensed annually; to require an applicant for a license to pay an application fee; to authorize the department of health and environmental sciences to collect fees; amending sections 7-13-231, 75-10-102, 75-10-104, 75-10-115, 75-10-204, and 75-10-221, MCA; and providing an effective date and an applicability date.*". A copy of the bill, as signed into law, is attached for your reference.

The fee law takes effect on July 1, 1991, but is retro-active to January 1, 1990. The details of implementing the fees are yet to be worked out, but we can tell you the following for certain:

Who is required to pay fees:

- All solid waste management system license holders.
  Includes class II and III solid waste landfills, transfer stations, container sites, composting facilities, solid waste incinerators, etc.
- All applicants for a solid waste management system license.

Who is required to be licensed:

- All public and private solid waste management systems of all kinds in Montana, except for a few specifically exempted entities. Those exempted from the requirement to obtain a solid waste management system license are:
  - a person disposing of his/her own waste on his/her own property (5 acres or more) generated in reasonable association with his/her household or agricultural operations;
  - operation of an electrical generating facility;
  - drilling, production or refining of natural gas or petroleum; or

AN EQUAL OPPORTUNITY EMPLOYER

- the operation of a mine, mill, smelter, or electrolytic reduction facility.

Existing solid waste systems, who pays how much (annually):
The fees for existing solid waste management systems are directly related to the annual capacity in tons of that system. All system license holders must pay a base fee. All systems that dispose of or incinerate solid wastes must pay an additional 31 cent per ton fee for every ton of solid waste disposed of or incinerated.

Capacity of System	Base Annual Fee
more than 25,000 tons per year	$3,500 + 31 cents per ton
5,000 to 25,000 tons per year	$3,000 + 31 cents per ton
less than 5,000 tons per year	$2,500 + 31 cents per ton

To lessen the impact on local government, DHES intends to promulgate rules requiring the fees for existing solid waste management systems be paid on a quarterly basis. An example of what this could mean to a local government is:

> Assuming a city owned a landfill that accepts 4000 tons per year of solid waste, the city would owe the state fees of $2,500 plus 31 cents times 4,000, or a total of $3,740. The city could then pay one quarter of the fee ($935) this October 1, another payment of $935 on January 1, 1992, the third on April 1, 1992, and the final payment for the first year would be due on July 1, 1992.

Applications for new solid waste management system licenses (application fee):
Again, application fees for new or significantly modified solid waste management systems must pay a one-time application fee that is directly related to the capacity of the proposed system.

Capacity of System	Application Fee
more than 25,000 tons per year	$10,000
5,000 to 25,000 tons per year	$7,500
less than 5,000 tons per year	$5,000

The application fees presently apply to all solid waste management systems. DHES may provide for a reduced fee scale for Class III and some other types of solid waste management systems.

Application fees will be due on July 1, 1991 for most license applicants that have not fully responded to a DHES Notice of Deficiency by July 1, 1991.

Please feel free to contact me if you have any further questions or concerns about this matter.

Sincerely,

Anthony W. Grover
Solid Waste Program Manager

cc: Patti Powell, DHES Legal

Proof

ROUTE SLIP

DEPARTMENT OF HEALTH & ENVIRONMENTAL SCIENCES

TO: DATE: 9 Oct 91

1. Patti P.
2. Roger T Ret
3. Dwayne

☑ Approval
☐ Note and Return
☐ Prepare reply
☐ As requested
☐ Comment
☐ Note and File
☐ Signature
☐ For your information
☐ Necessary Action
☐ Investigate
☐ See Me
☐ Per Conversation

REMARKS: They wanted it in writing.

mailed 10/10/91 LL

FROM: JPC

Big Timber
LF
Sweet Grass

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

STAN STEPHENS, GOVERNOR

FAX #(406) 444-1499

STATE OF MONTANA

OFFICE LOCATION: 836 Front Street
Helena, Montana

MAILING ADDRESS: Cogswell Building
Helena, MT 59620

Solid and Hazardous Waste Bureau
Telephone (406) 444-1430

October 9, 1991

Mr. Kevin Hutchins
City of Big Timber
P.O. Box 416
Big Timber, MT 59011

Dear Mr. Hutchins:

The operations plan approved for the Big Timber Class II Sanitary Landfill (license number 308) included provisions for the occasional burning of clean, untreated wood wastes provided that a permit was first obtained from the Air Quality Bureau of the Montana Department of Health and Environmental Sciences. The contact person there is Cathy Quinones at 444-3454. Once she has your permit application in hand, she will call our Bureau to determine if we have any objections due to lack of permission in the operations plan or observations of improper wastes in the burn pile during one of our inspections. If she has no objections from us and the other aspects of the permit are complete to her satisfaction then she will process your permit application.

I hope this answers your questions concerning our involvement in the burning permit process. I am glad to hear of your desire to operate your new landfill in the best possible manner. Thank you for your cooperation.

Sincerely,

F Patrick Crowley

F. Patrick Crowley
Solid Waste Program

FPC/fpc

cc: Cathy Quinones, MDHES/AQB.

"AN EQUAL OPPORTUNITY EMPLOYER"

Big Timber
Sweet Grass C

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES

STAN STEPHENS, GOVERNOR
FAX #(406) 444-1499

STATE OF MONTANA

OFFICE LOCATION: 836 Front Street
Helena, Montana

MAILING ADDRESS: Cogswell Building
Helena, MT 59620

Solid & Hazardous Waste Bureau
Telephone (406) 444-1430

January 31, 1991

James A. Devenny, Mayor
City of Big Timber
P.O. Box 416
Big Timber, MT 59011

Dear Jim;

I would like to thank you and the other members of the City Council for the opportunity to attend and participate in your meeting concerning the planning of the operation of your new landfill. I was impressed by the effort put forth by the members of the council and the city staff in exploring the options for setting up a recycling and baling operation.

As requested, I have reviewed the proposed closure plan for the existing Big Timber landfill that was submitted in March, 1990 by your consultants, Damschen and Associates. The department approves the plans as submitted. We do have two very strong recommendations concerning the closure. First, since the site's soils and previous cover material are very permeable and coarse, we recommend that the final foot of cover material to be used for the final cap as planned for in the closure plan be a hydraulic conductivity of 10^{-3} centimeters per second or less. This would require a soil material that contained a significant fraction of silt or clay material. Since this site was unlicensed because of its inappropriate location and permeable soils, I believe the council should take this extra care to try to insure that no environmental impacts will be caused by this site in the future. Secondly, the side slopes of the site are designed to be a 3:1 slope. The steepness of these slopes may not be stable and could be susceptible to erosion. The city will be responsible for continued maintenance of the site and the cover material if erosion occurs. The department's approval of this closure plan in no way releases the City from any liability for this solid waste disposal site.

After the meeting, I reviewed the City's application for the new landfill concerning some of your construction specifications. The change in location of the building site from north of the pipeline to south of it is acceptable, however if a septic system is to be installed prior approval by the department will be required. The perimeter fence that was proposed in the application (page 6) which is a condition of your license was described as follows:

> "The perimeter fence will include hog wire with two strands of barbed wire on top. This fence should prevent illegal entrance of individuals as well as livestock. This fence should also catch litter that escapes the active fill area."

Therefore, the specifications for the fencing discussed by Barry Damschen were insufficient to meet the conditions of your license. The existing fence on the north and east sides of the property being a 4-strand barb wire fence is not what was approved. The department would accept construction of a hog wire fence on the north and east sides of the landfill area as an alternative. This would better meet the stated goals of your application than replacing the existing perimeter fencing. We would recommend a height of approximately eight feet for this downwind fence, similar to the fence the Town of Melstone constructed for their new landfill. I would also like to repeat that if this fence with the portable screens are not effective in controlling litter, additional measures will be required. Also for your information the City of Bozeman has constructed several new portable litter screens with some design modifications for more flexibility of use and the Council may want to investigate these changes and the contractor who constructed them.

Thank you again for your cooperation in this whole landfill permitting process and if you have any further questions do not hesitate to contact me. Also please keep us informed of your plans and any changes. If you decide to go with the balefill option we can discuss other modifications of the conditions of the landfill license, such as fencing requirements and building specifications.

Sincerely,

James Wilbur

James Wilbur
Solid Waste Program

cc: Barry Damschen, Damschen & Associates, Inc., P.O. Box 4817, Helena, MT 59604

TABLE 1

BIG TIMBER SOLID WASTE ALTERNATIVES

CAPITAL COSTS

Cost Component	Landfill Only	Bale at Landfill	Bale in Big Timber
20 Yr. Components			
1. Site Work and Utilities	-	$125,000	$100,000
2. Building	-	350,000	350,000
3. Engineering and Contingency	-	125,000	125,000
Subtotal	0	$600,000	$575,000
10 Yr. Components			
1. Baler		140,000	140,000
2. Conveyers, hoppers, etc.	-	75,000	75,000
3. Installation & Freight	-	54,000	54,000
4. Spare Parts	-	22,000	22,000
5. Contingency (10%)	-	29,000	29,000
Subtotal	0	$320,000	$320,000
5 Yr. Components			
1. Front End Loader	-	60,000	45,000
2. Add. Loader at Landfill	-	-	20,000
3. Flatbed & Tractor	-	-	50,000
4. Track Loader (LF)	85,000	-	-
5. Contingency (10%)	9,000	6,000	12,000
Subtotal	$94,000	$ 66,000	$127,000
TOTAL	$94,000	$986,000	$1,022,000

TABLE 2

BIG TIMBER

ANNUAL COSTS

Cost Component	Landfill Only	Bale at Landfill	Bale in Big Timber
BALE FACILITY			
1. Labor	-	$65,000	$65,000
2. Utilities	-	4,000	4,000
3. Site Maintenance	-	1,000	1,000
4. Equipment O & M	-	6,000	6,000
5. Insurance	-	5,000	5,000
6. Contingency (10%)	-	8,000	8,000
Subtotal	0	$89,000	$89,000
II LANDFILL			
1. Labor	$50,000	Included	$ 5,000
2. Equipment O & M	20,000	5,000	7,000
3. Trench Excavation	2,000	500	500
4. Contingency (10%)	7,000	500	1,500
Subtotal	$79,000	$6,000	$14,000

TABLE 3

BIG TIMBER

ANNUAL SYSTEM COST ANALYSIS

Cost Component	Landfill Only	Bale at Landfill	Bale in Big Timber
1. Amort. of Landfill	$11,000	$ 4,000	$ 4,000
2. Haul from Big TImber to Landfill	5,000	5,000	2,000
3. Amortization of Capital (8%)			
20 year Component	-	60,000	58,000
10 year Component	-	48,000	48,000
5 year Component	18,000	12,000	24,000
4. Facility Operations Costs			
Baler Facility	-	89,000	89,000
Landfill	79,000	6,000	14,000
TOTAL COSTS	$113,000	$224,000	$239,000
Less Sale of Recyclables	-	20,000	20,000
TOTAL ANNUAL SYSTEM COST	$113,000	$204,000	$219,000

BIG TIMBER LANDFILL PROJECT

ITEM			
LAND	94,000.00		94,000.00
SITE WORK (POND -LEVELING)	11,000.00		5,500.00
TRENCH	15,000.00		15,000.00
FENCING	16,000.00		8,000.00
UTILITIES	10,000.00		0.00
BUILDING UNFINISHED	19,000.00	60x100 FINISHED, CONCRETE FLOOR, ELECTRICTY, & PLUMBING	79,700.00
LITTER FENCE	12,000.00		4,000.00
ROADWORK TO FIRST PIT	23,000.00		23,000.00
MONITORING WELLS, TESTING	20,000.00		20,000.00
SURVEY, ENGINEERING, ETC.	25,000.00		25,000.00
OLD LANDFILL CLOSURE	90,000.00		90,000.00
CONTINGENCY	17,000.00		17,000.00
WELLS TEST ANALYSIS	4,000.00		4,000.00
BOND ISSUE EXPENSE	9,000.00		9,000.00
TRACK LOADER	85,000.00		0.00
TOTAL	450,000.00		
		BALER	43,000.00
		CONVEYOR	9,000.00
		TRAILER	10,000.00
		BOBCAT	20,000.00
		TOTAL	458,200.00

Big Timber
SweetGrass

D&A

DAMSCHEN & ASSOCIATES, INC.
CONSULTING ENGINEERS

2030 11TH AVENUE • SUITE 11
P.O. BOX 4817 • HELENA, MT 59604
TELEPHONE (406) 449-8627

December 20, 1990

Mr. James Wilbur
Montana Department of Health and Environmental Sciences
Solid & Hazardous Waste Bureau
Room B201
Cogsell Building
Helena, MT 59620

Dear Jim,

Please find enclosed a copy of plan sheet #5 of the Big Timber landfill plan set. This sheet has been revised to include a leachate witness/collection sump as requested by your department in a letter dated 12/7/90. If you have any questions or comments, feel free to give me a call.

Sincerely,
Damschen & Associates, Inc.

Robert Church
Robert Church,
Project Engineer

cc: City of Big Timber

RECEIVED
ACr

DEC 21 1990

MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID & HAZARDOUS WASTE BUREAU

Big Timber - nea
Sweetgrass

Sweet Grass Family Medicine

P.O. Box 1409
Big Timber, MT 59011
(406) 932-5920

Wallace C. Walker, MD, ABFP
Susan L. Johnston, PA-C

December 11, 1990

James Wilbur
Solid Waste Program
Solid and Hazardous Waste Bureau
Dept. of Health and Environmental Sciences
Cogswell Building
Helena, MT 59620

RE: Licensing of Big Timber Landfill

Dear Mr. Wilbur,

I am in receipt today of your letter of December 7, 1990. You request my validation of a license for the proposed Big Timber Landfill located on the Howie Rd. I understand that my approval for this license is based on the Montana Solid Waste Management Act, as well as the completed environmental assessment. You have neglected to enclose either one of these documents for my review. At this time, I am unable to sign this document as I am inadequately informed. I would request that you forward to me a copy of both of those documents for my review.

In future communications with me, I would suggest that you enclose copies of all documents pertaining to my decisions. It has been my past policy not to render professional judgments based on interpretation of data by a second party. I have no intention of changing this approach at this point in my professional career. At this time I will withhold my signature from this application pending my review of the Montana Solid Waste Management Act and the environmental assessment completed for this proposed dump site.

Sincerely,

WC Walker, MD

Wallace C. Walker, M.D.

WCW/jla

RECEIVED

DEC 18 1990

MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID & HAZARDOUS WASTE BUREAU